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A Joint Program for  
Agriculture and  
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Surveys Through  
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Remote Sensing

## Supporting Research

June 1981

### "AS-BUILT" DESIGN SPECIFICATION FOR PARHIS

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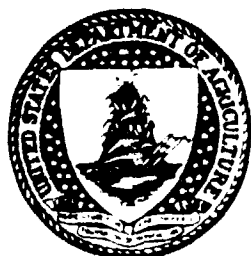
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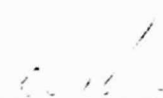
"AS-BUILT" DESIGN SPECIFICATION  
FOR  
PARHIS

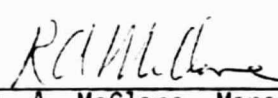
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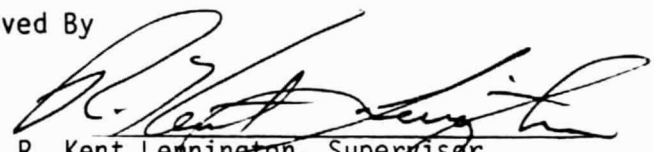
Prepared By

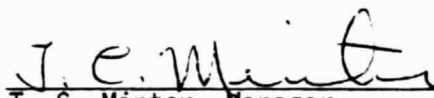
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16. Abstract This document is the "As-Built" Design Specification for the PARHIS program which is part of the CLASFYG package. The program produces histograms of the greenness profile derived parameters $\alpha$ , $\beta$ , $t$ , and $\chi^2$ computed by the CLASFYG program and statistical information concerning the parameters.					
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CONTENTS

Section	Page
1.0 SCOPE. . . . .	1-1
2.0 APPLICABLE DOCUMENTS . . . . .	2-1
3.0 SYSTEM DESCRIPTION . . . . .	3-1
3.1 <u>SYSTEM FLOWCHART</u> . . . . .	3-1
3.2 <u>HARDWARE DESCRIPTION</u> . . . . .	3-4
3.3 <u>SOFTWARE DESCRIPTION</u> . . . . .	3-5
3.4 <u>FILE DESCRIPTIONS</u> . . . . .	3-7
3.4.1 INPUT FILE(S) . . . . .	3-7
3.4.2 USER DEFINED FILE < SYMBOL FILENAME > < SYMBOL FILETYPE> A. 3-8	
3.4.3 USER DEFINED FILE <FILENAME> CC A . . . . .	3-10
3.5.1 PROGRAM PARHIS. . . . .	3-12
3.5.2 SUBROUTINE APLOTS . . . . .	3-16
3.5.3 SUBROUTINE BIN. . . . .	3-19
3.5.4 SUBROUTINE CROPP. . . . .	3-21
3.5.5 SUBROUTINE HISTOS . . . . .	3-23
3.5.6 FUNCTION ICE. . . . .	3-25
3.5.7 FUNCTION IVALUE . . . . .	3-27
3.5.8 SUBROUTINE JULIAN . . . . .	3-29
3.5.9 SUBROUTINE PHISIN . . . . .	3-31
4.0 OPERATION. . . . .	4-1
4.1 <u>OPERATING DESCRIPTION</u> . . . . .	4-1
4.2 <u>COMMANDS DESCRIPTION</u> . . . . .	4-2
4.2.1 START. . . . .	4-3

## CONTENTS

Section	Page
4.2.2 DEFGTRU. . . . .	4-4
4.2.3 DEFCLAS. . . . .	4-5
4.2.4 FARHIS . . . . .	4-6
4.2.5 END . . . . .	4-7
4.3 <u>OPERATING EXAMPLE</u> . . . . .	4-8

### Appendices

A. COMMON BLOCK . . . . .	A-1
B. PROGRAM LISTINGS . . . . .	B-1
C. JOB CONTROL SOFTWARE . . . . .	C-1
D. PROGRAM RUN EXAMPLES . . . . .	D-1

## FIGURES

Figure	Page
3.1.1 System level flow diagram for the PARHIS Program. . . . .	3-2
3.1.2 Hierarchy diagram for the PARHIS Program. . . . .	3-3

## PARHIS PROGRAM

### 1.0 SCOPE

This document contains the description of the implementation of the PARHIS program. The purposes of the program are as follows:

- (1) To produce histograms of the greenness profile derived parameters  $\alpha$ ,  $\beta$ ,  $t_0$  and  $\chi^2$ . Alpha is the approximate greenness rise time, Beta is the approximate greenness decay time,  $t_0$  is the spectral crop emergence date, and  $\chi^2$  per degree of freedom is the goodness of fit of the actual data to the computed greenness profile.
- (2) To produce statistical information concerning the  $\alpha$ ,  $\beta$ ,  $t_0$  and  $\chi^2$  parameters computed by the CLASFYG Program.

## 2.0 APPLICABLE DOCUMENTS

The following documents form a part of this specification:

AD 63-2457-3308-03 Transferring Badhwar Software.

AD NAS 9-15200 Technical Memorandum Format Specifications for LACIE (Phase III) and Accuracy Assessment Computer Data Products.

### 3.0 SYSTEM DESCRIPTION

#### 3.1 SYSTEM FLOWCHART

The system level data flow diagram for the PARHIS Program is depicted in Figure 3.1.1. A program hierarchy is shown in Figure 3.1.2.

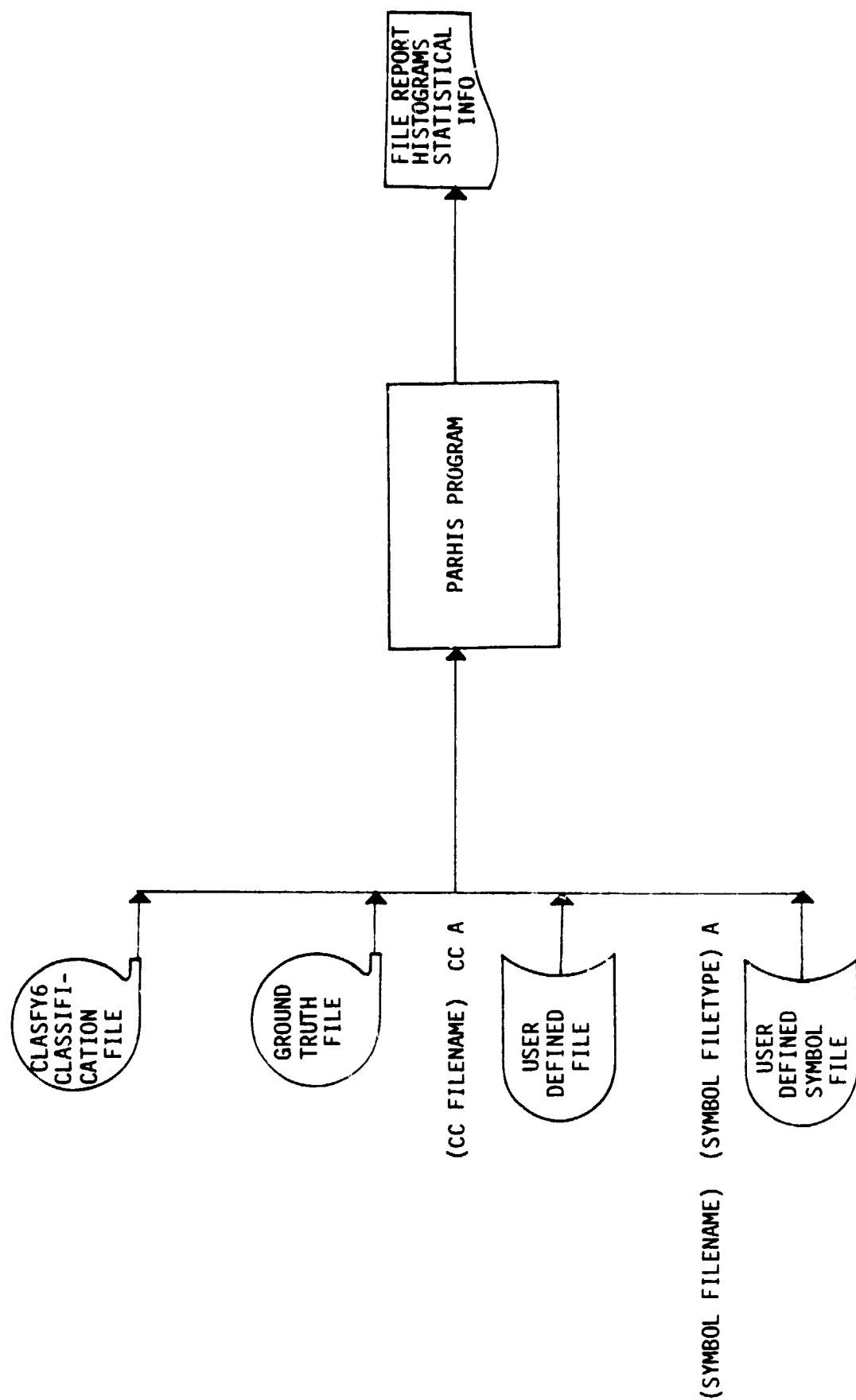


Figure 3.3.1 - System level flow diagram for the PARHIS program.

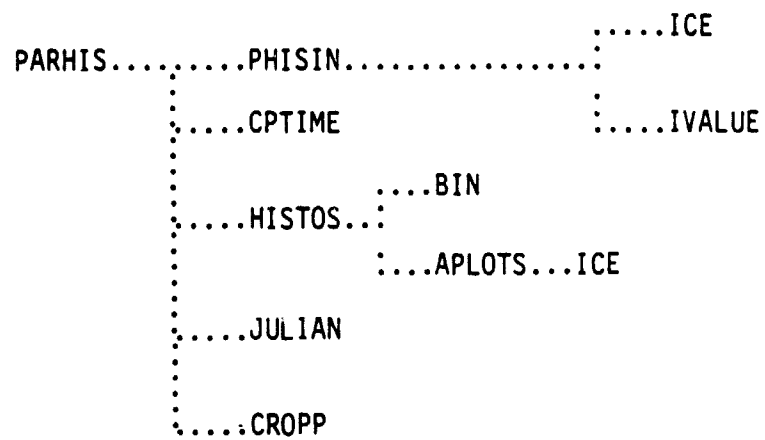


Figure 3.1.2 Hierarchy diagram for the PARHIS Program.



### 3.2 HARDWARE DESCRIPTION

The software for the PARHIS Program is operational on the IBM 3031 computer at PURDUE.

### 3.3 SOFTWARE DESCRIPTION

PARHIS was designed to produce histograms of the parameters  $\alpha$ ,  $\beta$ ,  $t_0$ , and  $\chi^2$  computed by the CLASFYG Program. Alpha is the approximate greenness rise time, Beta is the approximate decay time,  $t_0$  is the spectral crop emergence date and  $\chi^2$  per degree of freedom is the goodness of fit of the actual data to the computed greenness profile. Two sets of histograms are available to the user. If the user specifies a limit to be applied before updating the histograms, histograms will be produced for each of parameters and for the ground truth codes. These limits are input to the program via the control card file and pertain to a upper limit specified for the  $\chi^2$  parameters, a lower limit for the  $t_0$  parameters, and a lower limit for the  $\alpha$  parameters (See Section 3.4.3 for a complete description of the CUTS card). If no limits are specified histograms are produced for each parameter. For any given run, histograms can be obtained for up to three categories. A category can be a single ground truth class like "spring wheat", or a combination of ground truth classes like "small grains". Ground Truth codes are mapped to specific categories through a "ground truth transformation" table. (See Section 3.4.2 for a complete description of the ground truth transformation table).

Ground truth data is used in the process of determining if a specific pixel value is among the categories chosen to be graphed. The program processes each pixel in the following manner:

- (1) The pixel is assigned to a majority category. This majority category is either the category of the first subpixel or is the category which occurs the most among the six sub-pixels categories.
- (2) The pixel's majority ground truth code value is saved for eventual output.
- (3) Through the use of the ground truth transformation table a transformed numeric code is assigned to each of the six ground truth sub-pixels which correspond to the given pixel.

- (4) The number of occurrence of the majority category is defined to be the purity of the given pixel. This purity is compared to a user specified pixel purity range, and if the number of occurrences fall outside of this range then there is no further processing of this pixel.
- (5) If the majority category is greater than the number of categories specified by the user then there is no further processing of this pixel.
- (6) If the pixel value of the classification parameter  $\alpha$  is zero then there is no further processing of the pixel.
- (7) If there are no limits specified the histograms are updated according to the classification parameter to reflect the occurrence of an additional pixel. If limits are specified then each classification parameter must first pass the applied limit test before the histograms are updated.
- (8) Statistical variables are updated.

When each pixel has been processed the program computes statistical information for all pixels, and the histograms and statistical information are printed.

### 3.4 FILE DESCRIPTIONS

#### 3.4.1 INPUT FILE

Two input data files are required to execute the PARHIS program. The two files and their descriptions are as follows:

PARHIS accepts as input, a classification file output from the CLASFGY PROGRAM. This classification file consist of 118 records. The first record is a header record consisting of 3060 bytes. The header record follows universal format requirements. Records 2 - 118 contain data records. Each data record consists of 196 pixel vectors. Each pixel vector consists of four parameters:  $\alpha$ ,  $\beta$ ,  $t_0$ , and  $\chi^2$ . Each parameter contains a signed integer value stored in a 32 - bit full word. (For a complete description of this file see "As-Built" Design Specification for CLASFGY.)

The Ground Truth file is in universal format with one channel per physical record. There are 351 records of length 540 8 bit-bytes. The contents of each byte have been biased with -128 and are stored in 8 bit twos-complement notation. (For a complete description of the file see Earth Resources Data Format Control Book, Volume 1, PH0-TR543).

### 3.4.2 USER DEFINED FILE <SYMBOL FILENAME> <SYMBOL FILETYPE> A

This file is used to specify (1) the pixel purity range and (2) the ground truth transformations.

The pixel purity range defines the acceptable pixel purity for any given execution of the PARHIS PROGRAM. (For a complete description of pixel purity See Section 3.3.) The ground truth transformation allows the user to map specific ground truth codes to "Classification Categories". These categories correspond to the numerical order of the categories entered on the CROP control card in the required control card file (See Section 3.4.3 for all exceptions concerning the use of this card). Therefore, any assignment of a crop code to a category greater than the total number of categories entered signifies that the code is of no interest. If a crop code is not assigned to a category the program assigns as a default a category of 6. The last entry in the symbol file must be 0 0 0.

The first entry in the symbol file is as follows:

Column	1	2	3		
Format	I1	1X	I1	:	Purpose
	Start		end		Defines the start and end of a range of pixel purity.

The remaining entries in the symbol file are as follows:

Columns	1-5	6-10	11-15		
Format	I5	I5	I5	:	Purpose
	start	end	category	:	Defines the start and end of a range of crop values assigned to a category.
	0	0	0		Signifies the end of Ground Truth transformation information.

The following is an example of a symbol file.

1	6	
1	10	1
11	20	2
21	79	3
80	80	6
84	86	2
127	127	3
164	164	6
165	165	3
0	0	0

### 3.4.3 USER DEFINED FILE <FILENAME> CC A

This Control Card file is used to specify inputs to the PARPHIS program.

The inputs are on card image records. Each record consists of (1) a keyword which is ten characters or less and begins in the first card column and (2) input parameters in columns 11 through 72. The following description lists the keywords and describes the corresponding inputs.

KEYWORD	ACCEPTABLE INPUTS	DESCRIPTION
ALPHARNG	Pair of positive numbers	This card defines the minimum and maximum values to be plotted for the Alpha parameter. The numbers are assumed to be positive real numbers and any integers will be converted. The numbers are separated by any delimiter except '.'.
BETARGN	Pair of positive numbers	This card defines the minimum and maximum values to be plotted for the Beta parameter. The numbers are assumed to be positive real numbers and any integers will be converted. The numbers are separated by any delimiter except '.'.
TØRNG	Pair of positive numbers	This card defines the minimum and maximum values to be plotted for the $t_0$ parameter. The numbers are assumed to be positive real numbers and any integers will be converted. The numbers are separated by any delimiter except '.'.
CROP	1-3 crop names	This card gives names to the categories to be plotted. The categories are separated by any non character delimiter except for a blank. Embedded blanks are considered part of a categorie's name.
CUTS	3 positive numbers	This card defines limits to be applied when updating the histograms. The numbers are assumed to be positive real numbers and any integers will be

KEYWORD	ACCEPTABLE INPUTS	DESCRIPTION
<hr/>		
		converted. The numbers are separated by any delimiter except '.'.
AI	Analyst's name	This card specifies the analysts name for report identification and is an optional input.
DATE	Free form	This card gives the date for report identification and is an optional input.
SEGMENT	Segment number	This card specifies the segment number for report identification and is an optional input.
*END	Ignored	This card identifies the end of the user defined cards.

The following is an example of a user's CONTROL CARD file with limits specified:

```

AI      MARY TOMPKINS
DATE    APRIL 8, 1981
SEGMENT 0123
ALPHARNG 0.0 4000.0
BETARNG  0.0 3600.0
TORNG    1000.0 2000.0
CROP     CORN, SOYBEAN, OTHERS
CUTS     400.0 1280.0 0.0
*END

```

The following is an example of a user's CONTROL CARD file without limits:

```

AI      MARY TOMPKINS
DATE    APRIL 8, 1981
SEGMENT 0123
ALPHARNG 0.0 4000.0
BETARNG  0.0 3600.0
TORNG    1000.0 2000.0
CROP     CORN, SOYBEAN, OTHERS
*END

```



### 3.5.1 PROGRAM PARHIS

#### Purpose

- (1) To produce histograms of the greenness profile derived parameters  $\alpha$ ,  $\beta$ ,  $t_0$ , and  $\chi^2$ . Alpha is the approximate greenness rise time, Beta is the approximate decay time,  $t_0$  is the spectral crop emergence date, and  $\chi^2$  per degree of freedom is the goodness of fit of the actual data to the computed greenness profile.
- (2) To produce statistical information concerning the  $\alpha$ ,  $\beta$ ,  $t_0$ , and  $\chi^2$  parameters computed by the CLASFYG Program.

#### Linkages

PARHIS calls PHISIN, HISTOS, JULIAN, and CROPP.

#### Interface

Calling sequence:

Not applicable (an example of an EXEC to execute PARHIS can be located in Section 4.0.)

Calling sequence parameters:

Not applicable.

Function value:

Not applicable.

Labeled COMMON parameters:

Full description of labeled COMMON blocks are contained in Appendix A.

<u>Label</u>	<u>Variable</u>	<u>Element Position</u>	<u>Input/ Output</u>	<u>Description</u>
/NSBIXL/	NSUBPX(6)	1	0	Six subpixel that map to a pixel.
/DEFGT/	GTRSEG	1	0	Ground Truth segment number.

<u>Label</u>	<u>Variable</u>	<u>Element Position</u>	<u>Input/ Output</u>	<u>Description</u>
	TYR	2	0	Year ground truth tape produced (this version.)
	GTDATE(3)	3	0	Julian date ground truth tape produced (this version.)
/DEFKL/	KLSEG	1	0	Landsat segment classified.
	KYR	2		Year classification tape produced.
	KLDATE(3)	3	0	Julian date classification tape produced.
/RHT/	RCROP(4,3)	1	0	Crop classes.
	RCUT(3)	2	0	Limits for $\alpha$ , $\beta$ , and $t_0$ parameters.
	ICUT	3	0	Flag; 1 - indicates present of parameter cuts.

Blank COMMON parameters:

None.

#### Inputs

<u>Unit</u>	<u>Type</u>	<u>Description</u>
9	Seq. data	Ground truth file (See Section 3.4.1).
10	Seq. data	Classification file (See Section 3.4.1).
19	Seq. data	Symbolic mapping elements, pixel purity range (See Section 3.4.2).

#### Outputs

<u>Unit</u>	<u>Type</u>	<u>Description</u>
5	Terminal	Run time descriptions.
6	Printer, disk	Plot report.

### Storage requirement

Not applicable.

### Description

Ground truth data is used in the process of determines if a specific pixel value is among the categories chosen to be graphed. The program processes each pixel in the following manner:

- (1) The pixel is assigned to a majority category. This majority category is either the category of the first subpixel or is the category which occurs the most among the six sub-pixels categories.
- (2) The majority pixel's ground truth code value is saved for eventual output.
- (3) Through the use of the ground truth transformation table a transformed numeric code is assigned to each of the six ground truth sub-pixels which correspond to the given pixel.
- (4) The number of occurrence of the majority category is defined to be the purity of the given pixel. This purity is compared to a user specified pixel purity range, and if the number of occurrences fall outside of this range then there is no further processing of this pixel.
- (5) If the majority category is greater than the number of categories specified by the user then there is no further processing of this pixel.
- (6) If the pixel value of the classification parameter  $\alpha$  is zero then there is no further processing of this pixel.
- (7) If there are no limits specified the histograms are updated according to the classification parameter to reflect the occurrence of an additional pixel. If limits are specified then each classification parameter must first pass the applied limit test before the histograms are updated.
- (8) Statistical variables are updated.

When each pixel has been processed the program computes statistical information for all pixels, and the histograms and statistical information are printed.

#### Listing

See Appendix B for program listing.

### 3.5.2 SUBROUTINE APLOTS

#### Purpose

To output histograms and statistical information.

#### Linkages

APLOTS is called by HISTOS.

#### Interface

Calling sequence:

CALL (NBIN, AML, DM, XMOM, AR, FIT, NFIT, NUNDR, NOVER, NPLOT)

Calling sequence parameters:

<u>Argument</u>	<u>Input/ Output</u>	<u>Description</u>
NBIN	I	Number of Bins.
AML	I	Lower edge of the histogram.
DM	I	Bin width.
XMOM	I	Vector to be plotted.
AR	I	Square root of ER (ERROR).
FIT	I	One dimension of vectors.
NFIT	I	Number of curves to be plotted.
NUNDR	I	Number under the lower limit of histograms.
NOVER	I	Number over the upper limit of histograms.
NPLOT	I	Number of the plot.

Function value:

Not applicable.

Labeled COMMON parameters:

Full description of labeled COMMON blocks are contained in Appendix A.

<u>Label</u>	<u>Variable</u>	<u>Element Position</u>	<u>Input/ Output</u>	<u>Description</u>
/RHT/	RCROP	1	I	Name of input crops.
	RCUT	2	I	Limits for Alpha, $t_0$ and CHI square.
	ICUT	3	I	Flag; for cut card, 1 = card parameters.
/DEFGT/	GTRSEG	1	I	Ground truth segment number.
	TYR	2	I	Year for GTRSEG.
	GTDATE	3	I	Julian date for GTRSEG.
/DEFKL/	KLASEG	1	I	Classification file segment number.
	KYR	2	I	Year for KLASEG.
	KLDATE	3	I	Julian date for KLASEG.

Blank COMMON parameters:

None.

Inputs

None.

Outputs

<u>Unit</u>	<u>Type</u>	<u>Description</u>
6	Report	Histograms and statistical information.

Storage requirement

Not applicable.

### Description

APLOTS updates vectors for plotting. It calculates statistical information which includes means, SIGMA values and errors of the vectors. It generates 12 histograms for Alpha, Beta,  $t_0$  and CHI-square on each crop, if there is no cuts card. Otherwise, it outputs 14 histograms including Alpha, Beta,  $t_0$  and CHI-square on each crop and ground truth code.

### Flowchart

Not applicable.

### Listing

See Appendix B for routine listing.

### 3.5.J SUBROUTINE BIN

#### Purpose

To check that the coefficients are within the range of lower and upper limits.

#### Linkages

BIN is called by HISTOS.

#### Interface

Calling sequence:

CALL (X, XMIN, DX, NBIN, IVEC)

Calling sequence parameters:

<u>Argument</u>	<u>Input/ Output</u>	<u>Description</u>
X	I	Coefficient for the plot.
XMIN	I	Minimum range of the coefficient.
DX	I	Width of the range (bin width).
NBIN	I	Number of BINS.
IVEC	I	Number of histogram to update.

Function value:

Not applicable.

Labeled COMMON parameters:

Full description of labeled COMMON blocks are contained in Appendix A.  
None.

Blank COMMON parameters:

None.



Inputs

None.

Outputs

None.

Storage requirement

Not applicable.

Description

BIN tests and returns if the coefficient value lies outside a defined limit; else, BIN updates the pixel count to reflect a coefficient's occurrence.

Flowchart

Not applicable.

Listing

See Appendix B for routine listing.

### 3.5.4 SUBROUTINE CROPP

#### Purpose

CROPP accepts six subpixels as input and outputs a pixel value representative of the subpixels.

#### Linkages

CROPP is called by PARHIS.

#### Interface

Calling sequence:

```
CALL CROPP (KROP, IXL CNT)
```

Calling sequence parameters:

<u>Argument</u>	<u>Input/ Output</u>	<u>Description</u>
KROP	0	Majority crop code.
IXLCNT	0	Count of number subpixels that match the majority code.

Function value:

Not applicable.

Labeled COMMON parameters:

Full description of labeled COMMON blocks are contained in Appendix A.

<u>Label</u>	<u>Variable</u>	<u>Element Position</u>	<u>Input/ Output</u>	<u>Description</u>
/NSBIXL/	NSUBPX(6)	1	I	Subpixels that map to a pixel.

Blank COMMON parameters:

None.

#### Inputs

None.

#### Outputs

None.

#### Storage requirement

Not applicable.

#### Description

The first sub-pixel value upon entry is considered to be the majority pixel (KROP) value. The NSUBPX array is traversed and the number of codes equal to KROP counted. This procedure continues until a count of each unique code is made. If at anytime a count becomes greater than the count of KROP this code becomes KROP's value.

#### Flowchart

Not applicable.

#### Listing

See Appendix B for routine listing.

### 3.5.5 SUBROUTINE HISTOS

#### Purpose

HISTOS sets plots=0, on the first call. It calls subroutines to update histograms and counters.

#### Linkages

HISTOS is called by PARHIS.  
HISTOS calls ALOTS and BIN.

#### Interface

Calling sequence:

CALL (IHIS, XLOW, NBIN, XHIGH, X, SCALE)

Calling sequence parameters:

<u>Argument</u>	<u>Input/ Output</u>	<u>Description</u>
IHIS	I	Number of histogram.
XLOW	I	Lower limit of histogram.
NBIN	I	The number of BINS.
XHIGH	I	Upper limit of histogram.
X	I	The variable vector of the histogram.
SCALE	I	The weight of the scale factors.

Function value:

Not applicable.

Labeled COMMON parameters:

None.

Blank COMMON parameters:

None.

### Inputs

None.

### Outputs

<u>Unit</u>	<u>Type</u>	<u>Description</u>
5	Terminal	Error MSG for number of histogram >50.

### Storage requirement

Not applicable.

### Description

HISTOS zeros the plot arrays on the first call, then checks the number of histograms. If the number of histograms is greater than or equal to 50, it outputs an error message. Otherwise, HISTOS updates the histograms and counters by calling APLOTS to output the histograms and bin to update the vector.

### Flowchart

Not applicable.

### Listing

See Appendix B for routine listing.

### 3.5.6 FUNCTION ICE

#### Purpose

To established the integer character equivalence of a byte.

#### Linkages

ICE is called by APLOTS, PHISIN.

#### Interface

Calling sequence:

K = ICE (INT)

Calling sequence parameters:

<u>Argument</u>	<u>Input/ Output</u>	<u>Description</u>
INT	I	One byte in character form.

Function value:

<u>Name</u>	<u>Description</u>
K	One byte in computation form.

Labeled COMMON parameters:

Full description of labeled COMMON blocks are contained in Appendix A.  
None.

Blank COMMON parameters:

None.

#### Inputs

None.

#### Outputs

None.

Storage requirement

Not applicable.

Description

ICE sets the input parameter to the function and returns.

Flowchart

Not applicable.

Listing

See Appendix B for function listing.

### 3.5.7 FUNCTION IVALUE

#### Purpose

To allow the in-line storage and testing of integer quoted literals.

#### Linkages

IVALUE is called by PHISIN.

#### Interface

Calling sequence:

K = IVALUE (INT)

Calling sequence parameters:

<u>Argument</u>	<u>Input/ Output</u>	<u>Description</u>
INT	I	Quoted literal declared integer.

Function value:

<u>Name</u>	<u>Description</u>
K	Quoted literal.

Labeled COMMON parameters:

Full description of labeled COMMON blocks are contained in Appendix A.  
None.

Blank COMMON parameters:

None.

#### Inputs

None.

#### Outputs

None.



Storage requirement

Not applicable.

Description

IVALUE sets quoted literals to integer function and returns.

Flowchart

Not applicable.

Listing

See Appendix B for function listing.

### 3.5.8 SUBROUTINE JULIAN

#### Purpose

To convert a Gregorian Calendar date to a Julian calendar date.

#### Linkages

JULIAN is called by PARHIS.

#### Interface

Calling sequence:

CALL JULIAN (JDATE, INERR, INDAY, INMNTH, INYEAR)

Calling sequence parameters:

<u>Argument</u>	<u>Input/ Output</u>	<u>Description</u>
JDATE(3)	O	Array to return Julian date.
INERR	O	Error flag indicating input value out of range (zero returned if no error occurred).
INDAY	I	Day of month.
INMNTH	I	Month of the year.
INYEAR	I	Last two digits of the year.

Function value:

Not applicable.

Labeled COMMON parameters:

Full description of labeled COMMON blocks are contained in Appendix A.  
None.

Blank COMMON parameters:

None.

#### Inputs

None.

#### Outputs

None.

#### Storage requirement

Not applicable.

#### Description

If the input day is less than 1 or greater than 31, and input month is less than 1 or greater than 12 set INERR = 1 for error flag and return. Compute Julian date from month and day. If the year is a Leap year and the month is greater than two add one to the computed Julian date.

#### Flowchart

Not applicable.

#### Listing

See Appendix B for routine listing.

### 3.5.9 SUBROUTINE PHISIN

#### Purpose

Reads, classifies, and analyzes cards describing the following:

AI,SEGMENT,DATE,FILE	DOCUMENTATION - READ AND WRITTEN.
ALPHARNG	MIN MAX RANGE FOR ALPHA COEFS.
BETARNG	MIN MAX RANGE FOR BETA COEFS.
TORNG	MIN MAX RANGE FOR TO COEFS.
CUTS	LOWER LIMIT FOR PARAMETER $\alpha$ , UPPER LIMIT FOR $t_0$ AND PARAMETERS $\beta$ .
RCROP	1-3 CROPS TO MAP. EMBEDDED BLANKS ARE INCLUDED IN NAME.
*END	SPECIFIES THE END OF USER DEFINED CARDS.

#### Linkages

PPLTIN is called by PARHIS.

#### Interface

Calling sequence:

CALL PPLTIN (NCROP, RCROP, RANGE, CUTS, IERR)

Calling sequence parameters:

<u>Argument</u>	<u>Input/ Output</u>	<u>Description</u>
NCROP	0	Total number of user input crops.
RCROP	0	Crops to be evaluated.
RANGE	0	Minimum maximum of Alpha, Beta, and $t_0$ .
CUTS	0	Limits for Alpha, Beta, and $t_0$ .
IERR	0	Error flag 0 = OK 1 = error

Function value:

Not applicable.

Labeled COMMON parameters:

Full description of labeled COMMON blocks are contained in Appendix A.  
None.

Blank COMMON parameters:

None.

### Inputs

<u>Unit</u>	<u>Type</u>	<u>Description</u>
21	Seq. data	User defined control card file (See Section 3.4.3).

### Outputs

<u>Unit</u>	<u>Type</u>	<u>Description</u>
20	Printer	Control card input for report.
5	Terminal	Run time errors.

### Storage requirement

Not applicable.

### Description

PPLTIN processes each input card. After the \*END card is reached PPLTIN test for the following conditions:

1. MORE/LESS THAN TWO NUMBERS ON THE ALPHA, BETA, TØ RANGE CARDS.
2. MIN>= MAX ON THE ALPHA, BETA, TO RANGE CARDS.
3. ALPHA, BETA, TO RANGE CARD MISSING.
4. MORE THAN THREE CROPS ON A CROP CAPD.
5. CROP CARD MISSING.
6. CUTS CARD PRESENT BUT ONE OR MORE VALUES.
7. MORE THAN THREE NUMBERS ON CUTS CARD.

If any of the conditions exist a diagnostic message is issued and IERR is set equal to one. If a control card is not recognized a warning message is printed.

Flowchart

Not applicable.

Listing

See Appendix B for routine listing.

## 4.0 OPERATION

### 4.1 OPERATING DESCRIPTION

PARHIS is operational on the IBM 3031 computer at LARS, West Lafayette, Indiana.

The PARHIS program is one of the programs of the BADHWAR SYSTEM which includes the programs CLASFYT, CLASFYG, MISMAP, PARPLT, PARHIS, and PARCLA.

PARHIS requires the user of a D disk which is assigned as a temporary disk and an E disk upon which is used to load LARS routines. The user, therefore, must not assign a disk to his machine using either MODE E or MODE D. These disks, will be assigned as needed.

Prior to executing the PARHIS program the user must (1) establish on his A disk a SYMBOL file as described in Section 3.4.2 and (2) establish the CONTROL CARD file as described in Section 3.4.3, if he wishes to use this file.

## 4.2 COMMANDS DESCRIPTION

To execute PARHIS, the user enters a series of commands which invoke the JOB CONTROL SOFTWARE. These commands are divided into two classes namely (1) FUNCTION commands and (2) PROGRAM commands. The FUNCTION commands, which perform all the functions except executing the program are reusable; i.e., once they are invoked they remain in effect until reentered. The PROGRAM commands, which execute the program, must be reentered each time the program is to be executed.

The following list gives the commands required to execute the PARHIS program. They are all FUNCTION commands except the PROGRAM command PARHIS. These commands must be given in the listed order except that the order of the DEFGTRU command and the DEFCLAS command may be interchanged.

START

DEFGTRU.....

DEFCLAS.....

PARHIS.....

END

The following sections describe each of the commands in detail. Input fields are separated by blanks. If more than one word is required to describe an input field, the descriptive text is enclosed in pointed brackets <>. If an input is optional the field is inclosed in square brackets []. Do not include these explanatory characters <> [] when actually submitting input to the computer. To enter a command the user types one input per defined input field and separates each field with a blank.



#### 4.2.1 START

The START command spools the user's console file. The use of this command, along with the END command, will provide a listing of all information appearing on the user's console file. (If running an interactive job, this is the terminal; if running a batch job this is a system defined device.)

The START command is invoked by the user typing the following:

START

#### 4.2.2 DEFGTRU

The DEFGTRU command defines a Ground Truth file. The user can use this command to define Ground Truth files on tape, disk, or may request the use of a file from the LARS RT&E Data Base. If the data request is for the use of a file from the LARS Data Base a series of programs are invoked to provide interface with the data base. The following diagram illustrates this software flow.

```

                                ..RTEERR (LARS ROUTINE)
DEFGTRU.....GTRUINF....
                                ..GTINFO (LARS ROUTINE)
```

For a detailed description of the above JOB CONTROL SOFTWARE See Appendix B.

The DEFGTRU command has the following forms and is invoked by typing one of the following, according to the user's requirement.

If the file is on tape -

```
DEFGTRU TAPE# FILE# < TAPE DENSITY >
```

If the file is on disk -

```
DEFGTRU FILENAME FILETYPE FILEMODE
```

If the file is on the LARS Data Base -

```
DEFGTRU SEGMENT# YEAR
              (year-last two digits of data generation year)
```

This command remains in effect for the use of any of the BADHWAR SYSTEM PROGRAM commands and does not have to be reissued unless the user wishes to redefine the input Ground Truth File.

#### 4.2.3 DEFCLAS

The DEFCLAS command defines the input Classification file. The user can use this command to define a Classification file on tape or disk. The DEFCLAS command has the following forms and is invoked by typing one of the following, according to the user's requirement.

If the file is on tape -

DEFCLAS TAPE# FILE# < TAPE DENSITY >

If the file is on disk -

DEFCLAS FILENAME FILETYPE FILEMODE

This command remains in effect for the use of any of the BADHWAR SYSTEM PROGRAM commands and does not have to be reissued unless the user wishes to redefine the input Classification File.

#### 4.2.4 PARHIS

The PARHIS command is a PROGRAM command and is used to invoke the execution of the PARHIS program. This command must not be used unless the DEFCLAS and the DEFGRTU FUNCTION commands have been previously issued. Also, as previously stated the user must have established a SYMBOL FILE and CONTROL CARD FILE on his A disk before invoking this command. The PARHIS command is invoked by the user typing the following:

```
PARHIS < SYMBOL FILENAME > < SYMBOL FILETYPE > < CONTROL CARD FILENAME >
```

The output from the PARHIS program is spooled to the HOUSTON line printer. The output consists of HISTOGRAMS and the USER INFORMATION file.

#### 4.2.5 END

This command closes the user's console file and causes a spooled copy to be sent to the HOUSTON printer. This command has no effect if the START command was not previously issued. The END command is invoked by the user typing the following.

END

### 4.3 OPERATING EXAMPLE

For our example we will assume the following:

The symbol file is established on the user's A disk under the file description: PARHIS1 DATA A.

The control card file is established on the user's A disk under the file description: PARHIS1 CC A.

The user has two different Classification files which he wishes to input to the PARHIS PROGRAM. He will therefore, issue two PROGRAM commands in his command sequence.

Furthermore, the user has elected to use a ground truth file at LARS.

COMMAND	EXPLANATION OR ACTION TAKEN
START	Spools the console file.
DEFGTRU 882 79	Defines a ground truth file using data from the LARS Data Base.
DEFCLAS 088279 079 B	Defines a class file on the users B disk. This data is on a disk which the user has previously attached to his disk using a B mode.
PARHIS PARHIS1 DATA PARHIS1	Executes the PARHIS PROGRAM.
DEFCLAS 2345 23 1600	Redefines the class file. This file is from a 1600 BPI tape.
PARHIS PARHIS1 DATA PARHIS1	Executes the PARHIS PROGRAM. The user has chosen to define his symbol file and CC file the same as in the previous execution of PARHIS.
END	Closes the user's console file and spools the files to the HOUSTON printer.

APPENDIX A  
COMMON BLOCKS

## COMMON BLOCKS

/NSBIXL/ NSUBPX(6)

NSUBPX Six subpixels that map to a pixel.

/DEFGT/ GTRSEG, TYR, GTDATE(3)

GTRSEG Ground truth segment number.

TYR Year of ground truth file creation.

GTDATE Julian date of ground truth file creation.

/DEFKL/ KLASSEG, KYR, KLDATE

KLASEG Classification segment number.

KYR Year of classification file creation.

KLDATE Julian date of classification creation.

/RHT/ RCROP, RCUT, ICUT

RCROP Names of crops input.

RCUT  $\alpha, \beta, t_0$  limits applied to graph output when the cut option is used.

ICUT A flag which is equal to zero if the cuts option is not used and one when the cuts option is used.



APPENDIX B  
PROGRAM LISTINGS

PERFORMS BEST IN THE FOLLOWING: WITH THE

### OPTIONS IN EFFECT:

NAME (LAST, FIRST, MIDDLE) \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_  
 PHONE ( ) \_\_\_\_\_  
 E-MAIL \_\_\_\_\_

**RESEARCH AND DEVELOPMENT**

DATE 11.19.21

JOHN STURGEON & SONS LTD.

**Appendix**

THIS PROGRAM PLANNING HISTORIANS OF THE PARAMETERS  
COMPUTED BY THE CLASYC PROGRAM

# MISYIM

THIS PROGRAM IS BASED ON THE PROGRAM AASIMAP. THEY ARE PART OF THE ORIGINAL PROGRAM MISMIP

J. CANNES	LFMSCO	3/19/74	ORIGINAL CODE (PDP)
JIMMERY TOMPKINS	LFMSCO	2/4/74	TRANSFER DESIGN
D. CHENG	LFMSCO	2/6/74	MODIFIED FOR IBM

УМЛ 3а

1. READ USER INFORMATION FILE FOR NO. OF GROUPS, KIND OF GROUPS, SCALE FACTORS FOR ALPHA, BETA, 10, CHI-SQUARE AND CUTS FOR THESE PARAMETERS.
2. READ THE NUMBER OF COMOS OF BOTH GROUND TRUTH AND CLASSIFICATION FILES AND PRINT OUT REPORT.
3. READ GROUND TRUTH FILE AND ASSIGN A TRANSFORMED CODE FOR EACH GROUND TRUTH COMPLETE. USE MAXIMUM VALUE FOR THE PIXEL CODE ASSIGNMENT.
4. READ CLASSIFICATION FILE FOR THE PARAMETERS, (ALPHA, BETA, 10, CHI-SQUARE) AND BY CODE, UPDATE THE HISTOGRAMS. IF CUTS, CANDIDATES, PLOT 14 HISTOGRAMS, ELSE PLOT 12 HISTOGRAMS.

## EXTERNAL REFERENCES

[illegible]

### RECEPTIONS

IF ANY OF THE FOLLOWING CONDITION EXISTS, SET IERH=1

1. PLANT QUALITY IMPROVEMENT PROGRAMS  
REPORTS ON PLANT QUALITY IMPROVEMENT  
PROGRAMS
2. CLASSIFICATION OF PLANT QUALITY IMPROVEMENT  
PROGRAMS
3. PLANT QUALITY IMPROVEMENT PROGRAMS  
REPORTS ON PLANT QUALITY IMPROVEMENT  
PROGRAMS
4. PLANT QUALITY IMPROVEMENT PROGRAMS  
REPORTS ON PLANT QUALITY IMPROVEMENT  
PROGRAMS

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PAGE 10740  
PAGE 10750  
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PAGE 11400  
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PAGE 11420  
PAGE 11430  
PAGE 11440  
PAGE 11450  
PAGE 11460  
PAGE 11470  
PAGE 11480  
PAGE 11490  
PAGE 11500

NO GROUND TRUTH TRANSFORMATION CODES  
IF IF=001 TERMINATE THE PROGRAM AND SEND THE MSG  
LOCAL DECLARATIONS  
IMPLICIT INTEGER (A-D,S-7)  
SET R=0  
GROUND TRUTH TRANSFORMATION CODES (1-6)  
SAMPLER VALUES THAT MAP TO A PIXEL  
ALPHA VALUES OF THE CLASSIFICATION FILE  
META VALUES OF THE CLASSIFICATION FILE  
TO VALUES OF THE CLASSIFICATION FILE  
CMI SQUARE VALUES OF THE CLASSIFICATION FILE  
FLAG FOR CUTS, CARDS, I-CARD PRESENTS, U=NO CARD  
CLASSIFICATION JULIAN DATE  
GROUND TRUTH JULIAN DATE  
BEGINNING VALUE OF TRANSFORMATION RANGE  
ENDING VALUE OF TRANSFORMATION RANGE  
TRANSFORMATION CODES (1 TO 6)  
LOWER LIMIT ON PIXEL PURITY  
UPPER LIMIT ON PIXEL PURITY  
NUMBER OF CROPS TO BE PROCESSED  
CLASSIFICATION SEGMENT NUMBER  
DATE OF THE MONTH IN THE CLASS HEADERS RECORDS  
MONTH OF THE YEAR IN THE CLASS HEADERS RECORDS  
YEAR IN THE CLASS HEADERS RECORDS  
GROUND TRUTH SEGMENT NUMBER  
DATE OF THE MONTH IN THE GROUND TRUTH HEADERS  
MONTH OF THE YEAR IN THE GROUND TRUTH HEADERS  
YEAR IN THE GROUND TRUTH HEADERS  
ERROR MSG FROM SUBROUTINE JULIAN  
ERROR FLAG TO TERMINATE THE PROGRAM, IERR=1  
GROUND TRUTH FILE DIMENSION CENTER  
117 ROWS OF PIXELS IN A FILE  
SAMPLER OF INTEREST  
196 PIXELS IN A LINE  
MAJORITY GROUND TRUTH CODES (TRANSFORMED)  
NUMBER OF FLUT  
OPTIME DAYS/MONTH/YEAR  
PAGE 10740  
PAGE 10750  
PAGE 10760  
PAGE 10770  
PAGE 10780  
PAGE 10790  
PAGE 10800  
PAGE 10810  
PAGE 10820  
PAGE 10830  
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PAGE 11450  
PAGE 11460  
PAGE 11470  
PAGE 11480  
PAGE 11490  
PAGE 11500

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LEVEL 2.3.0 (JUNE 74)

```

C      A      (MATH) OF 1.0 ADD. ROUND (F.6). ADD.
C      A      (MATH) OF 1.0 ADD. ROUND (F.6). ADD.
C      WITH FROM MESSAGE. PIXEL PURITY FROM
C      IFWR=1 (5,10000)
C      PRIF (5,10000)
C      ENTER IN THE ATININGS. MAXIMUMS FOR ALPHA, BETA, AND TO.
C      ENTER ALPHA AND PUT INTO X FOR PLOTS 1,2,3,4,5,6,7 & 8.
C      10 00 20 J=1,7,3
C      RANK(J)= RANKY(1)
C      RANK(J)= RANKY(1)
C      DATA(J)= RANKY(2)
C      DATA(J)= RANKY(2)
C      20 RANKY(J)= RANKY(2)
C      ENTER BETA AND PUT INTO Y FOR 1,4 & 7 AND X FOR 3, 6 & 9.
C      00 30 J=1,7,3
C      RANKY(J)= RANKY(3)
C      RANKY(J)= RANKY(3)
C      RANKY(J)= RANKY(3)
C      RANKY(J)= RANKY(3)
C      30 RANKY(J)= RANKY(3)
C      ENTER TO AND PUT INTO 2,3,5,6,8 & 9.
C      00 40 J=2,4,3
C      RANKY(J)= RANKY(5)
C      RANKY(J)= RANKY(6)
C      RANKY(J)= RANKY(5)
C      RANKY(J)= RANKY(6)
C      40 RANKY(J)= RANKY(6)
C      READ THE HEAD RECORD OF BOTH FILES.
C      AND CALL SUBPROGRAM FOR JULIAN DATE
C      READ(10,120) (MOR(1),1,3000)
C      KLASG = MOR(1)*2000 + MOR(6)
C      KDAY = MOR(6)
C      KMON = MOR(6)
C      KYR = MOR(6)
C      CALL JULIAN(KDATE, JERN, KDAY, KMON, KYR)
C      IF (JERN, NE, 0) IFRR=1
C      ERROR MSG FROM CLASSIFICATION HEADER. IF ERROR OCCURS, OUTPUT MSG
C      IF (JERN, NE, 0) PRIF (5,1010)
C      PRIF (5,1010)
C      READ(10,120) (MOR(1),1,3000)
C      KLASG = MOR(1)*2000 + MOR(6)
C      KDAY = MOR(6)
C      KMON = MOR(6)
C      KYR = MOR(6)
C      CALL JULIAN(KDATE, JERN, KDAY, KMON, KYR)
C      IF (JERN, NE, 0) IFRR = 1
C      ERROR MSG FROM GROUPED TRUTH HEADER. IF ERROR OCCURS, OUTPUT MSG
C      IF (JERN, NE, 0) PRIF (5,1020)
C      IF (GTRSEG, NE, KLASG) IFRR=1
C      FROM MSG FROM 40TH SEGMENT NO.. IF ERROR OCCURS, OUTPUT MSG
C      IF (GTRSEG, NE, KLASG) PRIF (5,1025) KLASG, GTRSEG
C      PRINT OUT HEADERS FOR SEGMENT NO., JULIAN DATE AND PIXEL PURITY
C      WITH (5,1040) GTRSEG, KYR, (GDATE(1),1,3)
C      WITH (5,1040) KLASG, KYR, (KDATE(1),1,3)
C      WITH (5,1050) PRIF (5,1050)
C      SET GROUPED TRUTH TRANSFORMATION ARRAY TO ALL 6'S.

```

PAGE 2300  
PAGE 2310  
PAGE 2320  
PAGE 2330  
PAGE 2340  
PAGE 2350  
PAGE 2360  
PAGE 2370  
PAGE 2380  
PAGE 2390  
PAGE 2400  
PAGE 2410  
PAGE 2420  
PAGE 2430  
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PAGE 2470  
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PAGE 2970  
PAGE 2980  
PAGE 2990  
PAGE 3000  
PAGE 3010  
PAGE 3020  
PAGE 3030  
PAGE 3040  
PAGE 3050  
PAGE 3060  
PAGE 3070



READ THROUGH IMAGES, ONE LINE AT A TIME FOR CLASSIFICATION FILE  
THE VALUES OF ALPHA, BETA, TO AND MEDIA  
AND THREE LINES AT A TIME FOR THE GROUND TRUTH FILE.

DO 400 I=1,117

DEAD(10,1170,50,500) (ALPH(I),BET(I),TRU(I),CHW(I),I=1,196)

READ GROUND TRUTH FILE INTO A 3550 ARRAY  
FOR I = 1,3 J = 1,72. GTRU(I,J) CONTAINS ANCILLARY DATA.  
GROUND TRUTH FILE CONTAINS 5 TIMES AS MUCH DATA AS THE  
CLASSIFICATION FILE. SO, CORRESPONDING TO EACH VIDEO BLOCK (196  
BYTES) OF THE CLASSIFICATION FILE, THE GROUND TRUTH FILE IS TWICE  
AS LONG AND THREE ROWS DEEP.  
SURVEIL DATA REFUTED 2 COLUMNS AND 3 ROWS.  
READ 72 CONTROL CHARACTERS \* 2196 ADJUSTED TO A MULTIPLE  
OF 180.

DO 170 J=1,3  
READ(4,1200) (GTRU(1,80,1,1)=1,540)

MAKE COMPARISON ON PIXEL BY PIXEL BASIS.

DO 300 SA=1,196

DETERMINE GROUND TRUTH CODE  
GTRU1 IS A 64270 ARRAY EQUIVALENT TO GTRU(1,1,1) FOR I = 1,6 J = 1,36  
CHARACTERS ARE NOW STORED IN GTRU1(1,1) FOR I = 1,6 J = 1,36  
AND SURVEIL DATA REFUTED 1 COLUMN AND 6 ROWS.

DO 180 SP1X=1,6  
GTRU1(SPIX,SA,36)

ADD 128 TO COMPENSATE FOR ADJUSTMENT MADE IN CARTO LAM

DO 180 J=1,255 MEM=256  
IF (MEM,GT,255) MEM=256  
GTRU1(SPIX,SA,36)

DETERMINE MAJORITY RULE CODE FOR PIXEL.

CALL GTRU1(GTRU1,NC)  
RCODE=FLD(GTRU1,NC)  
GTRU1=RCODE

IF (NC,LT,MPH,04,NC,GT,MPH,04) GO TO 300

IF (GTRU1,GT,MPH,04) GO TO 300

IF THE VALUE IS 7,40, THIS IS BAD DATA

IF (GTRU1(SA,36),EQ,0) GO TO 300

COUNT NUMBER OF PIXELS

STAT(GTRU1)=TOT(GTRU1)+1,0

SEND DATA TO THE PROPER ROUTINE

AND CALL FOR PLOT

DATA=ALPH(SA,36)  
BETA=ALPH(SA,36)  
TRU=ALPH(SA,36)  
CHW=ALPH(SA,36)  
GTRU1=ALPH(SA,36)

IF (ICUT,EQ,1) GO TO 250

WITHOUT CUTS CWD, PLOTS 12 FOLLOWING HISTOGRAMS

CALL HISTOGRAM(1,0,50,500,ALPH,1)  
CALL HISTOGRAM(2,0,50,500,ALPH,1)  
CALL HISTOGRAM(3,1000,50,2000,ALPH,1)  
CALL HISTOGRAM(4,0,50,1000,ALPH,1)

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15

\*\*\*\*\*  
 NOV 21 1966  
 CONGRESS  
 REFERENCE  
 DIVISION  
 \*\*\*\*\*

JOHN A. S.

CONFIDENTIAL

●●●●●

707  
708  
709

0075  
0071  
0071

B-8

LIST 14, 00000

Label	Offset	Value	Comment
00	0000	0075	
01	0005	0071	
02	0115	0114	
03	0117	0120	
04	0125	0120	
05	0129	0124	
06	0130	0117	
07	0134	0127	
08	0135	0123	
09	0137	0123	
10	0137	0124	
11	0137	0124	
12	0137	0124	
13	0137	0124	
14	0137	0124	
15	0137	0124	
16	0137	0124	
17	0137	0124	
18	0137	0124	
19	0137	0124	
20	0137	0124	
21	0137	0124	
22	0137	0124	
23	0137	0124	
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26	0137	0124	
27	0137	0124	
28	0137	0124	
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34	0137	0124	
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36	0137	0124	
37	0137	0124	
38	0137	0124	
39	0137	0124	
40	0137	0124	
41	0137	0124	
42	0137	0124	
43	0137	0124	
44	0137	0124	
45	0137	0124	
46	0137	0124	
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54	0137	0124	
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56	0137	0124	
57	0137	0124	
58	0137	0124	
59	0137	0124	
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62	0137	0124	
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67	0137	0124	
68	0137	0124	
69	0137	0124	
70	0137	0124	
71	0137	0124	
72	0137	0124	
73	0137	0124	
74	0137	0124	
75	0137	0124	
76	0137	0124	
77	0137	0124	
78	0137	0124	
79	0137	0124	
80	0137	0124	
81	0137	0124	
82	0137	0124	
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84	0137	0124	
85	0137	0124	
86	0137	0124	
87	0137	0124	
88	0137	0124	
89	0137	0124	
90	0137	0124	
91	0137	0124	
92	0137	0124	
93	0137	0124	
94	0137	0124	
95	0137	0124	
96	0137	0124	
97	0137	0124	
98	0137	0124	
99	0137	0124	

[illegible]

\*\*\*\*\*  
**NOTED FOR INFORMATION**  
 \*\*\*\*\*

NAME OF COMMON BLOCK	NUMBER	SIZE OF BLOCK	HEXADECIMAL BYTES
COMMON BLOCK	1	100	00000100
COMMON BLOCK	2	200	00000200
COMMON BLOCK	3	300	00000300
COMMON BLOCK	4	400	00000400
COMMON BLOCK	5	500	00000500
COMMON BLOCK	6	600	00000600
COMMON BLOCK	7	700	00000700
COMMON BLOCK	8	800	00000800
COMMON BLOCK	9	900	00000900
COMMON BLOCK	10	1000	000001000
COMMON BLOCK	11	1100	000001100
COMMON BLOCK	12	1200	000001200
COMMON BLOCK	13	1300	000001300
COMMON BLOCK	14	1400	000001400
COMMON BLOCK	15	1500	000001500
COMMON BLOCK	16	1600	000001600
COMMON BLOCK	17	1700	000001700
COMMON BLOCK	18	1800	000001800
COMMON BLOCK	19	1900	000001900
COMMON BLOCK	20	2000	000002000
COMMON BLOCK	21	2100	000002100
COMMON BLOCK	22	2200	000002200
COMMON BLOCK	23	2300	000002300
COMMON BLOCK	24	2400	000002400
COMMON BLOCK	25	2500	000002500
COMMON BLOCK	26	2600	000002600
COMMON BLOCK	27	2700	000002700
COMMON BLOCK	28	2800	000002800
COMMON BLOCK	29	2900	000002900
COMMON BLOCK	30	3000	000003000
COMMON BLOCK	31	3100	000003100
COMMON BLOCK	32	3200	000003200
COMMON BLOCK	33	3300	000003300
COMMON BLOCK	34	3400	000003400
COMMON BLOCK	35	3500	000003500
COMMON BLOCK	36	3600	000003600
COMMON BLOCK	37	3700	000003700
COMMON BLOCK	38	3800	000003800
COMMON BLOCK	39	3900	000003900
COMMON BLOCK	40	4000	000004000
COMMON BLOCK	41	4100	000004100
COMMON BLOCK	42	4200	000004200
COMMON BLOCK	43	4300	000004300
COMMON BLOCK	44	4400	000004400
COMMON BLOCK	45	4500	000004500
COMMON BLOCK	46	4600	000004600
COMMON BLOCK	47	4700	000004700
COMMON BLOCK	48	4800	000004800
COMMON BLOCK	49	4900	000004900
COMMON BLOCK	50	5000	000005000
COMMON BLOCK	51	5100	000005100
COMMON BLOCK	52	5200	000005200
COMMON BLOCK	53	5300	000005300
COMMON BLOCK	54	5400	000005400
COMMON BLOCK	55	5500	000005500
COMMON BLOCK	56	5600	000005600
COMMON BLOCK	57	5700	000005700
COMMON BLOCK	58	5800	000005800
COMMON BLOCK	59	5900	000005900
COMMON BLOCK	60	6000	000006000
COMMON BLOCK	61	6100	000006100
COMMON BLOCK	62	6200	000006200
COMMON BLOCK	63	6300	000006300
COMMON BLOCK	64	6400	000006400
COMMON BLOCK	65	6500	000006500
COMMON BLOCK	66	6600	000006600
COMMON BLOCK	67	6700	000006700
COMMON BLOCK	68	6800	000006800
COMMON BLOCK	69	6900	000006900
COMMON BLOCK	70	7000	000007000
COMMON BLOCK	71	7100	000007100
COMMON BLOCK	72	7200	000007200
COMMON BLOCK	73	7300	000007300
COMMON BLOCK	74	7400	000007400
COMMON BLOCK	75	7500	000007500
COMMON BLOCK	76	7600	000007600
COMMON BLOCK	77	7700	000007700
COMMON BLOCK	78	7800	000007800
COMMON BLOCK	79	7900	000007900
COMMON BLOCK	80	8000	000008000
COMMON BLOCK	81	8100	000008100
COMMON BLOCK	82	8200	000008200
COMMON BLOCK	83	8300	000008300
COMMON BLOCK	84	8400	000008400
COMMON BLOCK	85	8500	

VAP. NAME	MTI. ADDR.	VAM. NAME	REL. ADDR.	VAR. NAME	MTI. ADDR.	REL. ADDR.
PSUMING	104					

NAME OF COMMON BLOCK \* NAME \* SIZE OF BLOCK \* ADDRESS \* EXTENDED \*  
 VAR. NAME TYPE \* NAME \* SIZE OF BLOCK \* ADDRESS \* EXTENDED \*  
 NAME OF COMMON BLOCK \* NAME \* SIZE OF BLOCK \* ADDRESS \* EXTENDED \*  
 VAR. NAME TYPE \* NAME \* SIZE OF BLOCK \* ADDRESS \* EXTENDED \*  
 NAME OF COMMON BLOCK \* NAME \* SIZE OF BLOCK \* ADDRESS \* EXTENDED \*

SOURCE STATEMENT LABELS

LABEL	ISN	ADDR	ISN	ADDR	ISN	ADDR	ISN	ADDR
10	71	0020C4	10	0020C4	10	0020C4	10	0020C4
20	117	0020C4	20	0020C4	20	0020C4	20	0020C4
30	117	0020C4	30	0020C4	30	0020C4	30	0020C4
40	117	0020C4	40	0020C4	40	0020C4	40	0020C4
50	117	0020C4	50	0020C4	50	0020C4	50	0020C4

COMPILER GENERATED LABELS

LABEL	ISN	ADDR	ISN	ADDR	ISN	ADDR	ISN	ADDR
100000	1	0020C4	100000	1	0020C4	100000	1	0020C4
100001	2	0020C4	100001	2	0020C4	100001	2	0020C4
100002	3	0020C4	100002	3	0020C4	100002	3	0020C4
100003	4	0020C4	100003	4	0020C4	100003	4	0020C4
100004	5	0020C4	100004	5	0020C4	100004	5	0020C4

FORMAT STATEMENT LABELS

LABEL	ISN	ADDR	ISN	ADDR	ISN	ADDR	ISN	ADDR
1000	214	000029	1000	214	000029	1000	214	000029
1001	214	000029	1001	214	000029	1001	214	000029
1002	214	000029	1002	214	000029	1002	214	000029
1003	214	000029	1003	214	000029	1003	214	000029
1004	214	000029	1004	214	000029	1004	214	000029

\*OPTIONS IN EFFECT: NAME (C-411) OPT (C-11) LINE COUNT (100) SIZE (MAX) AUTODIAG (NONE)  
 \*OPTIONS IN EFFECT: SOURCE ENCODED (N) LIST ADDRESS OBJECT MAP NOFORMAT NOGOSTMT NAME ALLOC NOANSF NOTERM IBM FLAG (1)  
 \*STATISTICS\* SOURCE STATEMENTS = 241\* PROGRAM SIZE = 14558\* SUPERPROGRAM NAME = MAIN  
 \*STATISTICS\* NO DIAGNOSTICS GENERATED  
 \*\*\*\*\* END OF COMPILATION \*\*\*\*\*

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REQUESTED OPTIONS: NONE\*

OPTIONS IN EFFECT: NAME (MAIN) OPTIMIZE(1) LTRC(0) SIZE (MAX) AUTODI (NONE)  
SOURCE EXECUTIVE NOT 1ST MODEL ON PCT MAP NOFORMAT NOGOSTMT XREF ALC NOANSF NOTERM IBM FLAG(1)

ISN 0002

SUBROUTINE APIOTS1

I NPIH, NPIH IS THE NO OF HITS  
I AML, LOWER EDGE OF THE HISTOGRAM  
I DM, DM IS THE MIN WIDTH  
I XMOD, XMOD IS THE VECTOR TO BE PLOTTED  
I AP, AP IS THE SQUARE OF THE ASSIGNED ERROR E.G.  
IF THE COUNTS IS N, FIT IS THE CURVE C  
THAT CAN BE PLOTTED ON THE HISTOGRAM. IT IS  
SPECIFIED IN THE HINS AS THE ORIGINAL BINS.  
I FIT, IT IS IN THE FORM A ONE DIMENSIONAL VECTORS.  
A TOTAL OF N FIT CURVES CAN BE PRODUCED.  
I NFIT, NFIT IS THE NUMBER OF CURVES TO PLOTTED.  
THE MAXIMUM NUMBER OF CURVES IS FIVE.  
I NIMPH, NIMPH IS THE UNDER IN THE HISTOGRAM  
I NOVEM, NOVEM IS THE OVER FLOW IN THE HISTOGRAM  
I NPLT, NPLT IS THE NUMBER OF THE PLOT

HISTORY

MARY AM TOMPKINS LEMSCO 03/25/81 IBM REDO FROM PDP  
DONALD F. CHENG LEMSCO 03/26/81 INPUT HEADER INFO

METHOD

PROGRAM OUTPUTS THE HISTOGRAMS. STATISTICAL INFORMATION IS COMPUTED  
FOR ALL PIXEL AND FOR PIXELS PLOTTING TO SAME LOCATION.

NOTE:  
REDO OF PROGRAM CONSIST MAINLY OF RESTRUCTURING OF PROGRAM.  
THE LOGIC AND VARIABLE NAMES ARE THE ORIGINAL.

EXTERNAL REFERENCES

ICF ALLOWS IN LINE TESTING AND STORING OF QUOTED LITERALS

EXCEPTIONS

NONE.

LOCAL DECLARATIONS

REAL WCONP(4,3) NAMES OF INPUT GROUPS.  
REAL WCONT(3) MINIMUMS FOR CUTS CARD  
REAL SCALE(1,5) SCALE IS THE CHARACTER INPUT FOR SCALE FACTORS  
REAL WCOND(3,3) RCOND IS THE CONDITION FOR CUTS  
INTEGER MYS(1) MYS IS ARGUMENTS FOR OPTIME, HOURS, MINUTES AND SE  
INTEGER MYS(2)

ISN 0003  
ISN 0004  
ISN 0005  
ISN 0006  
ISN 0007  
ISN 0008

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OF POOR QUALITY

PAGE 2

DATE 11.17.79/13.16.13

05/300 PUNCHING ATTEMPTED

LEVEL 2.3.0 (LINE 74)

APLUS

```
ISN 0009 C INTEGER GINSEGG DATE IS THE DATE FOR CPTIME
ISN 0010 C INTEGER KLASSEG GTDSEG IS THE GROUND TRUTH SEGMENT NO.
ISN 0011 C INTEGER TYM KLASSEG IS THE CLASSIFICATION SEGMENT NO.
ISN 0012 C INTEGER KYR TYM IS THE GROUND TRUTH YEAR
ISN 0013 C INTEGER GIDATF(3) KYR IS THE CLASSIFICATION YEAR
ISN 0014 C INTEGER KLDATF(3) GTDATE IS THE GROUND TRUTH JULIAN DATE
ISN 0015 C INTEGER NUMPLT KLDATE IS THE CLASSIFICATION JULIAN DATE
ISN 0016 C LOGICAL*1 IAC(125) NUMPLT IS THE NUMBER OF PLOTS
ISN 0017 C DIMENSION XMON(1) ONE LINE OF HISTOGRAM
ISN 0018 C COMMON/INT/ACHOP,ACHT,ICCT BASIS(10)*FT(1),AR(1)
ISN 0019 C COMMON/DEFCT/GTDSFG,GTG,GTDATE COMMON/DEFCT/KLASFG,KYH,KLDATE
ISN 0020 C DATA FUN/0/ DATA IAC/0/ DATA XMON/0/
ISN 0021 C DATA SCALE/1000/ DATA IAC/0/ DATA XMON/0/
ISN 0022 C DATA KCOND/0/ DATA IAC/0/ DATA XMON/0/
ISN 0023 C DATA KCOND/0/ DATA IAC/0/ DATA XMON/0/
```

THE FOLLOWING DATA STATEMENTS ARE FOR INITIATING COUNTER

```
ISN 0024 C DATA IAC/0/
ISN 0025 C DATA NUMPLT/0/
ISN 0026 C DATA IAC/0/
ISN 0027 C DATA IAC/0/
ISN 0028 C DATA IAC/0/
```

PROCEDURE

```
ISN 0029 C STOT=0.
ISN 0030 C DO 10 K=1,NHIN
ISN 0031 C STOT=STOT+XMON(K)
ISN 0032 C 10 CONTINUE
ISN 0033 C FUN=FLOAT(NHIN)
ISN 0034 C TOT=FLOAT(NHIN)*FUN+STOT
ISN 0035 C PARS(1)=100.*(XMON(1)+FUN)/TOT
ISN 0036 C DO 20 I=1,NHIN
ISN 0037 C PARS(I)=PARS(I-1)+100.*(XMON(I)/TOT)
ISN 0038 C 20 CONTINUE
```

IF ANY NEG DATA MOV PLOT 0 TO PG CTR

```
ISN 0039 C ANDR=30.
ISN 0040 C IST=1
ISN 0041 C DO 50 I=1,NHIN
ISN 0042 C IF (XMON(I).LT.0.)GO TO 60
ISN 0043 C 50 CONTINUE
ISN 0044 C ANORM=0.
ISN 0045 C IST=61
ISN 0046 C 60 NORM=ANORM
ISN 0047 C L=2*NORM+1
ISN 0048 C NFOT=NFIT+NHIN
ISN 0049 C SUMMON=0
ISN 0050 C DO 155 JPIN=1,NHIN
ISN 0051 C SUMMON=SUMMON+XMON(JPIN)
ISN 0052 C 155 CONTINUE
ISN 0053 C NPLOTT=SUMMON
ISN 0054 C SUMER=0
ISN 0055 C DO 165 JPIN=1,NHIN
ISN 0056 C SUMER=SUMER+XMON(JPIN)
ISN 0057 C 165 CONTINUE
ISN 0058 C PW=50*(AP(1))
ISN 0059 C A0=ARS(XMON(1))*ARS(EN)
ISN 0060 C DO 170 I=1,NHIN
ISN 0061 C PW=PW+ARS(XMON(I))
ISN 0062 C C=ARS(XMON(1))*ARS(EN)
ISN 0063 C IF (A0-C.LT.0)A0=C
ISN 0064 C
```



[illegible]





**MISSISSIPPI**

## LIST OF FIGURES

NAME	TAG	TYPE	ADDR	NAME	TAG	TYPE	ADDR	NAME	TAG	TYPE	ADDR	NAME	TAG	TYPE	ADDR
C	CF	100	00004C	ADD	CF	100	000050	NAME	F	100	000054	ADD	CF	100	000058
AB	A	100	00005C	ADD	CF	100	000060	ER	CF	100	000064	ADD	CF	100	000068
IM	CF	100	000067	ADD	CF	100	00006C	IK	CF	100	000070	ADD	CF	100	000074
SP	CF	100	00006A	ADD	CF	100	00006E	AM	CF	100	00007C	ADD	CF	100	000080
FL	CF	100	00006D	ADD	CF	100	000071	ICE	CF	100	00007E	ADD	CF	100	000084
FL	CF	100	00006F	ADD	CF	100	000073	PER	CF	100	000080	ADD	CF	100	000088
FL	CF	100	000071	ADD	CF	100	000075	DATE	CF	100	000084	ADD	CF	100	000092
FL	CF	100	000073	ADD	CF	100	000077	DATE	CF	100	000088	ADD	CF	100	000096
FL	CF	100	000075	ADD	CF	100	000079	NAME	CF	100	000090	ADD	CF	100	000100
FL	CF	100	000077	ADD	CF	100	000081	NAME	CF	100	000094	ADD	CF	100	000104
FL	CF	100	000079	ADD	CF	100	000083	NAME	CF	100	000098	ADD	CF	100	000108
FL	CF	100	000081	ADD	CF	100	000085	NAME	CF	100	000102	ADD	CF	100	000112
FL	CF	100	000083	ADD	CF	100	000087	NAME	CF	100	000106	ADD	CF	100	000116
FL	CF	100	000085	ADD	CF	100	000089	NAME	CF	100	000110	ADD	CF	100	000120
FL	CF	100	000087	ADD	CF	100	000091	NAME	CF	100	000114	ADD	CF	100	000124
FL	CF	100	000089	ADD	CF	100	000093	NAME	CF	100	000118	ADD	CF	100	000128
FL	CF	100	000091	ADD	CF	100	000095	NAME	CF	100	000122	ADD	CF	100	000132
FL	CF	100	000093	ADD	CF	100	000097	NAME	CF	100	000126	ADD	CF	100	000136
FL	CF	100	000095	ADD	CF	100	000099	NAME	CF	100	000130	ADD	CF	100	000140
FL	CF	100	000097	ADD	CF	100	000101	NAME	CF	100	000134	ADD	CF	100	000144
FL	CF	100	000099	ADD	CF	100	000103	NAME	CF	100	000138	ADD	CF	100	000148
FL	CF	100	000101	ADD	CF	100	000105	NAME	CF	100	000142	ADD	CF	100	000152
FL	CF	100	000103	ADD	CF	100	000107	NAME	CF	100	000146	ADD	CF	100	000156
FL	CF	100	000105	ADD	CF	100	000109	NAME	CF	100	000150	ADD	CF	100	000160
FL	CF	100	000107	ADD	CF	100	000111	NAME	CF	100	000154	ADD	CF	100	000164
FL	CF	100	000109	ADD	CF	100	000113	NAME	CF	100	000158	ADD	CF	100	000168
FL	CF	100	000111	ADD	CF	100	000115	NAME	CF	100	000162	ADD	CF	100	000172
FL	CF	100	000113	ADD	CF	100	000117	NAME	CF	100	000166	ADD	CF	100	000176
FL	CF	100	000115	ADD	CF	100	000119	NAME	CF	100	000170	ADD	CF	100	000180
FL	CF	100	000117	ADD	CF	100	000121	NAME	CF	100	000174	ADD	CF	100	000184
FL	CF	10													

[illegible]

\*\*\*\*\* PHOTOGRAPH INFORMATION \*\*\*\*\*

NAME OF COMMAND BLOCK • TYPE OF BLOCK 000049 HEXADECIMAL BYTES

VAR.	NAME	TYPE	PRI.	ANINP.	VAL.	NAMF	TYPE	MFL.	ADIND.	VAR.	NAME	TYPE	MFL.	ADIND.
	PCPWP	0004		0000000		W(III)	0004	000010					0000JC	

NAME OF COMMON BLOCK • DFFGT • 517 94 BLOCK 000014 HEXADECIMAL BYTES

[illegible]

NAME OF COMPANY BLOCK • OFFICE • SIZE OF BLOCK 000014 HEADOFFICIAL HYTES

[illegible]

**SOURCE STATF4FNT 1 AHFLS**

[illegible]

COMPILED (FIFC A T F I) L A N F L C

[illegible]

FORMER STATEMENT (1971)

LAHFL	TSN	ADW	LAHFL	TSN	ADW	LAHFL	TSN	ADW
140	71	000024	100	73	000050	210	83	000047
240	93	000004	200	102	000105	270	105	000150
310	115	000100	300	116	000140	330	120	000101
400	155	000105	390	131	000200	395	139	000232
	194	000205						

Options in Effect	Value	Optimal $F^*$	Life Count (MD)	Size (Max)	Autour (None)
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9
10	10	10	10	10	10
11	11	11	11	11	11
12	12	12	12	12	12
13	13	13	13	13	13
14	14	14	14	14	14
15	15	15	15	15	15
16	16	16	16	16	16
17	17	17	17	17	17
18	18	18	18	18	18
19	19	19	19	19	19
20	20	20	20	20	20
21	21	21	21	21	21
22	22	22	22	22	22
23	23	23	23	23	23
24	24	24	24	24	24
25	25	25	25	25	25
26	26	26	26	26	26
27	27	27	27	27	27
28	28	28	28	28	28
29	29	29	29	29	29
30	30	30	30	30	30
31	31	31	31	31	31
32	32	32	32	32	32
33	33	33	33	33	33
34	34	34	34	34	34
35	35	35	35	35	35
36	36	36	36	36	36
37	37	37	37	37	37
38	38	38	38	38	38
39	39	39	39	39	39
40	40	40	40	40	40
41	41	41	41	41	41
42	42	42	42	42	42
43	43	43	43	43	43
44	44	44	44	44	44
45	45	45	45	45	45
46	46	46	46	46	46
47	47	47	47	47	47
48	48	48	48	48	48
49	49	49	49	49	49
50	50	50	50	50	50
51	51	51	51	51	51
52	52	52	52	52	52
53	53	53	53	53	53
54	54	54	54	54	54
55	55	55	55	55	55
56	56	56	56	56	56
57	57	57	57	57	57
58	58	58	58	58	58
59	59	59	59	59	59
60	60	60	60	60	60
61	61	61	61	61	61
62	62	62	62	62	62
63	63	63	63	63	63
64	64	64	64	64	64
65	65	65	65	65	65
66	66	66	66	66	66
67	67	67	67	67	67
68	68	68	68	68	68
69	69	69	69	69	69
70	70	70	70	70	70
71	71	71	71	71	71
72	72	72	72	72	72
73	73	73	73	73	73
74	74	74	74	74	74

OPTIONS IN EFFECTIVE POLICY MIXTURE ON FCI MAP NEUTRAL MODSIMT REEF ALC INVAISE WUTERM IMM FLAG(1)

STATISTICS = 51361415 ADAMS  
1960. 10/15 4 441114 4 6.1 =  
JIMMIE = 5010. 10/15 4 441114 4 6.1

# STATISTICS • NO DIAGNOSTICS GETTABLE

\*\*\*\*\* FMF OF COMBAT VETERANS \*\*\*\*\*

2444 HYTES DR (NW) 13540



\*\*\*\*\* INTERNAL STATEMENT NUMBERS \*\*\*\*\*  
SYMBOL 0002 0005 0004  
DX 0002 0005  
MAIN 0002 0005 0010  
IVFC 0002 0005 0014  
MAIN 0002 0005 0014

NAME	TYPE	ADD.	NAME	TYPE	ADD.	NAME	TYPE	ADD.	NAME	TYPE	ADD.
MAIN	PS4	00000000	MAIN	PS4	00000000	MAIN	PS4	00000000	MAIN	PS4	00000000
IVFC	PS4	00000000	IVFC	PS4	00000000	IVFC	PS4	00000000	IVFC	PS4	00000000
DX	PS4	00000000	DX	PS4	00000000	DX	PS4	00000000	DX	PS4	00000000

\*\*\*\*\* END OF COMPILED \*\*\*\*\*

NAME	TYPE	ADD.	NAME	TYPE	ADD.	NAME	TYPE	ADD.	NAME	TYPE	ADD.
MAIN	PS4	00000000	MAIN	PS4	00000000	MAIN	PS4	00000000	MAIN	PS4	00000000
IVFC	PS4	00000000	IVFC	PS4	00000000	IVFC	PS4	00000000	IVFC	PS4	00000000
DX	PS4	00000000	DX	PS4	00000000	DX	PS4	00000000	DX	PS4	00000000

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OF POOR QUALITY

ISN 0002

SUBROUTINE CHOPP(KNOP, IALCNT)

CH000010

CH000020

CH000030

CH000040

CH000050

CH000060

CH000070

CH000080

CH000090

CH000100

CH000110

CH000120

CH000130

CH000140

CH000150

CH000160

CH000170

CH000180

CH000190

CH000200

CH000210

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\*\*\*\*\* U K T M A N C H O P P S R E F E R E N C E L I S T I N G \*\*\*\*\*

LABEL 10  
20  
0010  
0007  
0005  
0011

\*\*\*\*\* REFERENCES \*\*\*\*\*

NAME	ISN	ADDN	TAG	TYPE	NAME	ISN	ADDN	TAG	TYPE	NAME	ISN	ADDN	TAG	TYPE	NAME	ISN	ADDN	TAG	TYPE
KUUNT SF	10	000000	104	000000	NAME	10	000000	104	000000	NAME	10	000000	104	000000	NAME	10	000000	104	000000
ISN	10	000000	104	000000	ISN	10	000000	104	000000	ISN	10	000000	104	000000	ISN	10	000000	104	000000
ADDN	10	000000	104	000000	ADDN	10	000000	104	000000	ADDN	10	000000	104	000000	ADDN	10	000000	104	000000
TAG	10	000000	104	000000	TAG	10	000000	104	000000	TAG	10	000000	104	000000	TAG	10	000000	104	000000
TYPE	10	000000	104	000000	TYPE	10	000000	104	000000	TYPE	10	000000	104	000000	TYPE	10	000000	104	000000

\*\*\*\*\* COMMON INFORMATION \*\*\*\*\*

NAME OF COMMON BLOCK \*NSBTAL\* SIZE OF BLOCK 000010 HEXADECIMAL BYTES

VAR. NAME TYPE MEL. ADDN. VAR. NAME TYPE MEL. ADDN. VAR. NAME TYPE MEL. ADDN.

SOURCE STATEMENT LABELS

LABEL	ISN	ADDN	LABEL	ISN	ADDN	LABEL	ISN	ADDN
10	10	0000FE	20	17	00012C			

COMPILER GENERATED LABELS

LABEL	ISN	ADDN	LABEL	ISN	ADDN	LABEL	ISN	ADDN
100001	17	0000FC	100002	13	0000FC	100003	16	000114
100005	11	0000FC	100006	13	0000FC	100007	16	000114

\*OPTIONS IN EFFECT\*NAME(MAIN) OPTIMI/2(1) LINECOUNT(10) SIZE(MAX) AUTODBL(NONE)

\*OPTIONS IN EFFECT\*SOURCE EHCDC NOLIST NODECK OBJECT MAP NUFORHAT NUGOSTMT XREF ALL NUANSF NOTERM IBM FLAG(1)

\*STATISTICS\* SOURCE STATEMENTS = 18, PROGRAM SIZE = 404, SUBPROGRAM NAME = CHOPP

\*STATISTICS\* NO DIAGNOSTICS GENERATED

\*\*\*\*\* END OF COMPILATION \*\*\*\*\*

296K BYTES OF CODE NOT USED

ORIGINAL PAGE IS  
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ISN 0002

SUBROUTINE HISTO4  
 = THIS, NUMBER OF HISTOGRAMS  
 = KLOW, LOWER LIMIT OF HISTOGRAM  
 = KHIGH, UPPER LIMIT OF HISTOGRAM  
 = KLEFT, THE LEFT LIMIT OF THE HISTOGRAM  
 = KRIGHT, THE RIGHT LIMIT OF THE HISTOGRAM  
 = KSCALE, THE SCALE FACTOR OF THE HISTOGRAM  
 = KMETHOD, THE METHOD OF THE HISTOGRAM

HISTO4  
 = KMETHOD, THE METHOD OF THE HISTOGRAM  
 = KSCALE, THE SCALE FACTOR OF THE HISTOGRAM  
 = KLEFT, THE LEFT LIMIT OF THE HISTOGRAM  
 = KRIGHT, THE RIGHT LIMIT OF THE HISTOGRAM  
 = KHIGH, UPPER LIMIT OF HISTOGRAM  
 = KLOW, LOWER LIMIT OF HISTOGRAM  
 = THIS, NUMBER OF HISTOGRAMS

HISTO4  
 = KMETHOD, THE METHOD OF THE HISTOGRAM  
 = KSCALE, THE SCALE FACTOR OF THE HISTOGRAM  
 = KLEFT, THE LEFT LIMIT OF THE HISTOGRAM  
 = KRIGHT, THE RIGHT LIMIT OF THE HISTOGRAM  
 = KHIGH, UPPER LIMIT OF HISTOGRAM  
 = KLOW, LOWER LIMIT OF HISTOGRAM  
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 = KRIGHT, THE RIGHT LIMIT OF THE HISTOGRAM  
 = KHIGH, UPPER LIMIT OF HISTOGRAM  
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 = KRIGHT, THE RIGHT LIMIT OF THE HISTOGRAM  
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HISTO4  
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 = KLEFT, THE LEFT LIMIT OF THE HISTOGRAM  
 = KRIGHT, THE RIGHT LIMIT OF THE HISTOGRAM  
 = KHIGH, UPPER LIMIT OF HISTOGRAM  
 = KLOW, LOWER LIMIT OF HISTOGRAM  
 = THIS, NUMBER OF HISTOGRAMS

NAME (MAIN) OPTIMIZE (1) LINE COUNT (20) SIZE (100) AUTOMATE (NONE)  
 SOURCE (NONE) FOR (1) MODE (1) MAP (NONE) PROJECT (REF) ALC (NONE) NOTE (1) ILM FLAG (1)

HISTO4  
 = KMETHOD, THE METHOD OF THE HISTOGRAM  
 = KSCALE, THE SCALE FACTOR OF THE HISTOGRAM  
 = KLEFT, THE LEFT LIMIT OF THE HISTOGRAM  
 = KRIGHT, THE RIGHT LIMIT OF THE HISTOGRAM  
 = KHIGH, UPPER LIMIT OF HISTOGRAM  
 = KLOW, LOWER LIMIT OF HISTOGRAM  
 = THIS, NUMBER OF HISTOGRAMS

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PROCEDURE  
-----

IF THIS = 0 GO TO OUTPUT MODE

IF (THIS \* 2.0) GO TO 300

IF (INDEX \* 2.0) GO TO 20

ZERO HISTO AREA ON FIRST CALL

INDEX = 0

DO 11 I = 1, NHTS

THISC(I) = 0

NOVR(I) = 0

DO 11 J = 1, NHTS

11 ISSTO(J, I) = 0

FIRST RECORD THAT WAS CALLED

20 IF (THIS \* 2.0) GO TO 40

IF (LEAF \* 2.0) RETURN

PRINT (5, 100)

100 FORMAT (1000 MANY HISTOS

LEAF = 0

UPDATE HISTOGRAMS AND COUNTERS

40 CONTINUE

THISC(THIS) = THISC(THIS) + 1

XLO(THIS) = XLO

NHTS(THIS) = NHTS

IF (NHTS \* 2.0) NHTS = NHTS

CALL BINX (XLOW, XHIGH, NHTS)

CALL BINX (XLOW, XHIGH, NHTS)

IF (X \* 2.0) NHTS = NHTS

IF (X \* 2.0) NHTS = NHTS

RETURN

PLOT OUT AND CLEAR MODE FOLLOWS

300 DO 500 I = 1, NHTS

IF (THISC(I) \* 2.0) GO TO 500

DO 400 K0 = 1, NHTS

400 HUFF(K0) = ISSTO(K0, I)

CALL API(NTS(NHTS), XLO(I), HUFF, HUFF,

1000, 0, NHTS(I), NOVR(I), I)

500 CONTINUE

DO 520 I = 1, NHTS

THISC(I) = 0

NOVR(I) = 0

DO 520 J = 1, NHTS

ISSTO(J, I) = 0

LEAF = 1234

RETURN

END

\*\*\*\*\* F O R M A T C O S S P E R E N C E L I S T I N \*\*\*\*\*

SYMBOL INTERIOR STATEMENT NUMBERS

I 0020 0021 0022 0023 0024 0025 0026 0027 0028 0029 0030 0031 0032 0033 0034 0035 0036 0037 0038 0039 0040 0041 0042 0043 0044 0045 0046 0047 0048 0049 0050 0051 0052 0053 0054 0055 0056 0057 0058 0059 0060 0061 0062 0063 0064 0065 0066 0067 0068 0069 0070 0071 0072 0073 0074 0075 0076 0077 0078 0079 0080 0081 0082 0083 0084 0085 0086 0087 0088 0089 0090 0091 0092 0093 0094 0095 0096 0097 0098 0099 0100 0101 0102 0103 0104 0105 0106 0107 0108 0109 0110 0111 0112 0113 0114 0115 0116 0117 0118 0119 0120 0121 0122 0123 0124 0125 0126 0127 0128 0129 0130 0131 0132 0133 0134 0135 0136 0137 0138 0139 0140 0141 0142 0143 0144 0145 0146 0147 0148 0149 0150 0151 0152 0153 0154 0155 0156 0157 0158 0159 0160 0161 0162 0163 0164 0165 0166 0167 0168 0169 0170 0171 0172 0173 0174 0175 0176 0177 0178 0179 0180 0181 0182 0183 0184 0185 0186 0187 0188 0189 0190 0191 0192 0193 0194 0195 0196 0197 0198 0199 0200 0201 0202 0203 0204 0205 0206 0207 0208 0209 0210 0211 0212 0213 0214 0215 0216 0217 0218 0219 0220 0221 0222 0223 0224 0225 0226 0227 0228 0229 0230 0231 0232 0233 0234 0235 0236 0237 0238 0239 0240 0241 0242 0243 0244 0245 0246 0247 0248 0249 0250 0251 0252 0253 0254 0255 0256 0257 0258 0259 0260 0261 0262 0263 0264 0265 0266 0267 0268 0269 0270 0271 0272 0273 0274 0275 0276 0277 0278 0279 0280 0281 0282 0283 0284 0285 0286 0287 0288 0289 0290 0291 0292 0293 0294 0295 0296 0297 0298 0299 0300 0301 0302 0303 0304 0305 0306 0307 0308 0309 0310 0311 0312 0313 0314 0315 0316 0317 0318 0319 0320 0321 0322 0323 0324 0325 0326 0327 0328 0329 0330 0331 0332 0333 0334 0335 0336 0337 0338 0339 0340 0341 0342 0343 0344 0345 0346 0347 0348 0349 0350 0351 0352 0353 0354 0355 0356 0357 0358 0359 0360 0361 0362 0363 0364 0365 0366 0367 0368 0369 0370 0371 0372 0373 0374 0375 0376 0377 0378 0379 0380 0381 0382 0383 0384 0385 0386 0387 0388 0389 0390 0391 0392 0393 0394 0395 0396 0397 0398 0399 0400 0401 0402 0403 0404 0405 0406 0407 0408 0409 0410 0411 0412 0413 0414 0415 0416 0417 0418 0419 0420 0421 0422 0423 0424 0425 0426 0427 0428 0429 0430 0431 0432 0433 0434 0435 0436 0437 0438 0439 0440 0441 0442 0443 0444 0445 0446 0447 0448 0449 0450 0451 0452 0453 0454 0455 0456 0457 0458 0459 0460 0461 0462 0463 0464 0465 0466 0467 0468 0469 0470 0471 0472 0473 0474 0475 0476 0477 0478 0479 0480 0481 0482 0483 0484 0485 0486 0487 0488 0489 0490 0491 0492 0493 0494 0495 0496 0497 0498 0499 0500 0501 0502 0503 0504 0505 0506 0507 0508 0509 0510 0511 0512 0513 0514 0515 0516 0517 0518 0519 0520 0521 0522 0523 0524 0525 0526 0527 0528 0529 0530 0531 0532 0533 0534 0535 0536 0537 0538 0539 0540 0541 0542 0543 0544 0545 0546 0547 0548 0549 0550 0551 0552 0553 0554 0555 0556 0557 0558 0559 0560 0561 0562 0563 0564 0565 0566 0567 0568 0569 0570 0571 0572 0573 0574 0575 0576 0577 0578 0579 0580 0581 0582 0583 0584 0585 0586 0587 0588 0589 0590 0591 0592 0593 0594 0595 0596 0597 0598 0599 0600 0601 0602 0603 0604 0605 0606 0607 0608 0609 0610 0611 0612 0613 0614 0615 0616 0617 0618 0619 0620 0621 0622 0623 0624 0625 0626 0627 0628 0629 0630 0631 0632 0633 0634 0635 0636 0637 0638 0639 0640 0641 0642 0643 0644 0645 0646 0647 0648 0649 0650 0651 0652 0653 0654 0655 0656 0657 0658 0659 0660 0661 0662 0663 0664 0665 0666 0667 0668 0669 0670 0671 0672 0673 0674 0675 0676 0677 0678 0679 0680 0681 0682 0683 0684 0685 0686 0687 0688 0689 0690 0691 0692 0693 0694 0695 0696 0697 0698 0699 0700 0701 0702 0703 0704 0705 0706 0707 0708 0709 0710 0711 0712 0713 0714 0715 0716 0717 0718 0719 0720 0721 0722 0723 0724 0725 0726 0727 0728 0729 0730 0731 0732 0733 0734 0735 0736 0737 0738 0739 0740 0741 0742 0743 0744 0745 0746 0747 0748 0749 0750 0751 0752 0753 0754 0755 0756 0757 0758 0759 0760 0761 0762 0763 0764 0765 0766 0767 0768 0769 0770 0771 0772 0773 0774 0775 0776 0777 0778 0779 0780 0781 0782 0783 0784 0785 0786 0787 0788 0789 0790 0791 0792 0793 0794 0795 0796 0797 0798 0799 0800 0801 0802 0803 0804 0805 0806 0807 0808 0809 0810 0811 0812 0813 0814 0815 0816 0817 0818 0819 0820 0821 0822 0823 0824 0825 0826 0827 0828 0829 0830 0831 0832 0833 0834 0835 0836 0837 0838 0839 0840 0841 0842 0843 0844 0845 0846 0847 0848 0849 0850 0851 0852 0853 0854 0855 0856 0857 0858 0859 0860 0861 0862 0863 0864 0865 0866 0867 0868 0869 0870 0871 0872 0873 0874 0875 0876 0877 0878 0879 0880 0881 0882 0883 0884 0885 0886 0887 0888 0889 0890 0891 0892 0893 0894 0895 0896 0897 0898 0899 0900 0901 0902 0903 0904 0905 0906 0907 0908 0909 0910 0911 0912 0913 0914 0915 0916 0917 0918 0919 0920 0921 0922 0923 0924 0925 0926 0927 0928 0929 0930 0931 0932 0933 0934 0935 0936 0937 0938 0939 0940 0941 0942 0943 0944 0945 0946 0947 0948 0949 0950 0951 0952 0953 0954 0955 0956 0957 0958 0959 0960 0961 0962 0963 0964 0965 0966 0967 0968 0969 0970 0971 0972 0973 0974 0975 0976 0977 0978 0979 0980 0981 0982 0983 0984 0985 0986 0987 0988 0989 0990 0991 0992 0993 0994 0995 0996 0997 0998 0999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280 1281 1282 1283 1284 1285 1286 1287 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300 1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1350 1351 1352 1353 1354 1355 1356 1357 1358 1359 1360 1361 1362 1363 1364 1365 1366 1367 1368 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378 1379 1380 1381 1382 1383 1384 1385 1386 1387 1388 1389 1390 1391 1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404 1405 1406 1407 1408 1409 1410 1411 1412 1413 1414 1415 1416 1417 1418 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495 1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573 1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 1614 1615 1616 1617 1618 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1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867 1868 1869 1870 1871 1872 1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988





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REQUESTED OPTIONS: NONE

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(1) LINECOUNT(100) SIZE(MAX) AUTODBL(NONE)  
SOURCE ENCODED NON-IST CODECK OBJECT MAP INFORMATION NOGUSTAT XREF ALC HUANSF NOTERM IBM FLAG(1)

ISM 0002

INTEGER FUNCTION ICE(INT) INTEGER CHARACTER EQUIVALENCE

MISJURY

M & JADKINS LPMSCU 01/27/81 ORIGINAL CODE

METHOD

SET INPUT TO FUNCTION. RETURN.

EXCEPTIONS

IF THE FUNCTION IS APPLIED TO A WORD THE VALUE RETURNED IS OF  
THE LEFT MOST BYTE

LOCAL DECLARATION

LOGICAL\*1 INT

PROCEDURE

ICE = INT  
NE TUM-4  
END

ISM 0003

ISM 0004  
ISM 0005  
ISM 0006

SYMBOL INTERNAL STATEMENT NUMBERS CROSS REFERENCE LISTING \*\*\*\*\*

NAME ISN ADDR TYPE ADDR  
ICE 10001 2 000000

NAME	ISN	ADDR	TYPE	ADDR	NAME	TAG	TYPE	ADDR	NAME	TAG	TYPE	ADDR
ICE	10001	2	000000									

COMPILE GENERATED LABELS

LABEL	ISN	ADDR	LABEL	ISN	ADDR
10001	2	000000			

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(1) LINECOUNT(100) SIZE(MAX) AUTODBL(NONE)

OPTIONS IN EFFECT: SOURCE ENCODED NON-IST CODECK OBJECT MAP INFORMATION NOGUSTAT XREF ALC HUANSF NOTERM IBM FLAG(1)

\*STATISTICS\* SOURCE STATEMENTS = 5. PROGRAM SIZE = 194. SUBPROGRAM NAME = ICE

\*STATISTICS\* NO DIAGNOSTICS GENERATED

\*\*\*\*\* END OF COMPILATION \*\*\*\*\*

256K BYTES OF CORE NOT USED

ORIGINAL PHOTOCOPY  
OF POOR QUALITY

PAGE 1

DATE 01.180/12.31.14

US/360 FORM 100 EXTENDED

LEVEL 2.3.0 (JAN 78)

REQUESTED OPTIONS: NONE

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(1) LINECOUNT(10) SIZE(MAX) AUTOBL(NONE)  
SOURCE ENCLIC DON 1ST NODECK OBJECT MAP NUFUMAT NUGUSTMT AHEF ALL NUANSF NOTENN IBM FLAG(1)

TSN 0002

INTFORM FUNCTION IVALUE(10)

-----  
ALLOWS QUOTED LITERALS  
-----

HISTORY

M A TUMPKINS LFMSCU 01/27/81 ORIGINAL CODE

METHOD

SET INPUT TO FUNCTION. RETURN.

PROCEDURE

IVALUE = INT  
RETURN  
END

TSN 0003  
TSN 0004  
TSN 0005

\*\*\*\*\* G R T M A N C H O S S R E F E R E N C E L I S T I N G \*\*\*\*\*

SYMBOL INTERNAL STATEMENT NUMBERS  
INT 0002 0003  
IVALUE 0002 0003

SIZE OF PROGRAM 0000C2 HEXADECIMAL BYTES

NAME	INT	F	TAG	TYPE	ADD.	NAME	TAG	TYPE	ADD.
------	-----	---	-----	------	------	------	-----	------	------

COMPILER GENERATED LABELS

LABEL TSN ADDR  
100001 2 000000

OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(1) LINECOUNT(10) SIZE(MAX) AUTOBL(NONE)

OPTIONS IN EFFECT: SOURCE ENCLIC DON 1ST NODECK OBJECT MAP NUFUMAT NUGUSTMT AHEF ALL NUANSF NOTENN IBM FLAG(1)

\*STATISTICS\* SOURCE STATEMENTS = 4, PROGRAM SIZE = 194, SUBPROGRAM NAME = IVALUE

\*STATISTICS\* NO DIAGNOSTICS GENERATED

\*\*\*\*\* END OF COMPIATION \*\*\*\*\*

296K BYTES OF CODE NOT USED

ORIGINAL PAGE IS  
OF POOR QUALITY

```
*LEVEL 2.3.0 (JAN 78)
REQUESTED OPTIONS: NOTERM
OPTIONS IN EFFECT: NAME(MAIN) OPTIMIZE(1) LINECOUNT(80) SIZE(MAX) AUTODBL(NONE)
SOURCE ERCDIC NOLIST NODECK OBJECT MAP NOFORMAT NOGOSTM XREF ALC NOANSF NOTERM IBM FLAG(1)
DATE 81.141/10.12.17 PAGE 1

SUBROUTINE JULIAN (JDATE, INERR, INDAY, INMNT, INYEAR)
  JN 00010
  JN 00020
  JN 00030
  JN 00040
  JN 00050
  JN 00060
  JN 00070
  JN 00080
  JN 00090
  JN 00100
  JN 00110
  JN 00120
  JN 00130
  JN 00140
  JN 00150
  JN 00160
  JN 00170
  JN 00180
  JN 00190
  JN 00200
  JN 00210
  JN 00220
  JN 00230
  JN 00240
  JN 00250
  JN 00260
  JN 00270
  JN 00280
  JN 00290
  JN 00300
  JN 00310
  JN 00320
  JN 00330
  JN 00340
  JN 00350
  JN 00360
  JN 00370
  JN 00380
  JN 00390
  JN 00400
  JN 00410
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  JN 00430
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  JN 00450
  JN 00460
  JN 00470
  JN 00480
  JN 00490
  JN 00500
  JN 00510
  JN 00520
  JN 00530
  JN 00540
  JN 00550
  JN 00560
  JN 00570
  JN 00580
  JN 00590
  JN 00600
  JN 00610
  JN 00620
  JN 00630
  JN 00640
  JN 00650
  JN 00660
  JN 00670
  JN 00680
  JN 00690
  JN 00700
  JN 00710

  PURPOSE: TO CONVERT STANDARD DAY AND MONTH TO JULIAN DATE
  HISTORY: J C CRISP LEMSCO 02/09/81 ORIGINAL CODE

  DESCRIPTION OF ARGUMENTS:
  JDATE--ARRAY TO RETURN JULIAN DATE (1 DIGIT PER ARRAY ELEMENT)
  INERR--ERROR FLAG INDICATING INPUT VALUE OUT OF RANGE (ZERO,
  RETURNED IF NO ERROR OCCURS)
  INDAY--DAY OF MONTH
  INMNT--MONTH OF YEAR AS INTEGER
  INYEAR--LAST TWO DIGITS OF YEAR

  DESCRIPTION OF VARIABLES:
  JTEMP--TEMPORARY STORAGE FOR JULIAN DATE

  DIMENSION JDATE (3)

  CHECK FOR INPUT VALUE OUT OF RANGE
  IF ((INDAY.LT.1).OR.(INDAY.GT.31)) GO TO 800
  IF ((INMNT.LT.1).OR.(INMNT.GT.12)) GO TO 800

  DETERMINE JULIAN DATE FOR INPUT MONTH
  IF ((INMNT.EQ.1) JTEMP=0
  IF ((INMNT.EQ.2) JTEMP=31
  IF ((INMNT.EQ.3) JTEMP=59
  IF ((INMNT.EQ.4) JTEMP=90
  IF ((INMNT.EQ.5) JTEMP=120
  IF ((INMNT.EQ.6) JTEMP=151
  IF ((INMNT.EQ.7) JTEMP=181
  IF ((INMNT.EQ.8) JTEMP=212
  IF ((INMNT.EQ.9) JTEMP=243
  IF ((INMNT.EQ.10) JTEMP=273
  IF ((INMNT.EQ.11) JTEMP=304
  IF ((INMNT.EQ.12) JTEMP=334
  JTEMP=JTEMP+INDAY

  CHECK FOR LEAP YEAR AND ADD ONE DAY IF MONTH IS 3 OR GREATER
  IF ((INMNT.GE.3).AND.(MOD(INYEAR,4).EQ.0)) JTEMP=JTEMP+1

  STORE DATE IN ARRAY, ONE DIGIT PER ARRAY ELEMENT
  JDATE(1)=JTEMP/100
  JDATE(2)=(JTEMP-(JTEMP/100)*100)/10
  JDATE(3)=JTEMP-(JTEMP/10)*10
  INERR=0
  GO TO 900

  INPUT ERROR
  800 INERR=1
  900 RETURN
  END
```



```

TSN 0002  C  SIMULATION MISSING  PAGES INPUT FROM CARDS
          C  C CROPS  TOTAL NUMBER OF CROPS
          C  C CROPS  CROPS TO BE EVALUATED
          C  C RANGE  MIN AND MAX OF ALPHA, BETA, TO
          C  C CUTS  MIN CUTS FOR ALPHA, SIGMA, TO
          C  C TERM  FROM FLAG
          C  C 0 - OK
          C  C 1 - ERROR INCOUNTERED
          C  C -----
          C  C HISTORY
          C  C -----
          C  C MANY TOMPKINS  LEHSCN  02/15/81  ORIGINAL CODE
          C  C METHOD
          C  C -----
          C  C HEADS CLASSIFIES AND ANALYZES CARDS DESCRIBING THE FOLLOWING:
          C  C 1. SEGMENT DATE FILE DOCUMENTATION - READ AND WRITTEN
          C  C 2. MIN MAX RANGE FOR ALPHA COEFFS.
          C  C 3. MIN MAX RANGE FOR BETA COEFFS.
          C  C 4. MIN MAX RANGE FOR TO COEFFS.
          C  C 5. 1-3 CROPS TO MAP, ENCODED PLANKS
          C  C 6. ARE INCLUDED IN NAME FOR SIGMA, TO, ALPHA
          C  C 7. LOWER CUT OFF VALUES FOR USER DEFINED CARDS
          C  C 8. SPECIFICS THE END OF USER DEFINED CARDS
          C  C
          C  C EXTENSION REFERENCE
          C  C -----
          C  C ICE  INTEGER CHARACTER EQUIVALENT
          C  C VALUE ALLOWS FOR LINE TESTING / STOPPING OF QUOTED LITERALS.
          C  C
          C  C EXCEPTIONS
          C  C -----
          C  C IF ANY OF THE FOLLOWING CONDITIONS FIRST TERM IS SET EQUAL
          C  C TO 1, A DIAGNOSTIC MESSAGE IS ISSUED AND EXECUTION CONTINUES.
          C  C 1. MORE THAN 2 MEMBERS ON THE ALPHA, BETA, TO RANGE CARDS.
          C  C 2. MIN MAX RANGE ON THE ALPHA, BETA, TO RANGE CARDS.
          C  C 3. ALPHA, BETA, TO RANGE CARDS MISSING.
          C  C 4. MORE THAN 1 CROPS ON A CROP CARD.
          C  C 5. CROPS CARD MISSING ON A CROP CARD.
          C  C 6. CUTS CARD MISSING BUT ONE OR MORE VALUES < 0.
          C  C 7. MORE THAN THREE NUMBERS IN THE CUTS CARD.
          C  C 8. A CONTINUING CARD IS NOT RECOGNIZED AS ONE OF THE DEFINED
          C  C TYPE A WARNING MESSAGE IS PRINTED.
          C  C 9. IF A CUTS CARD IS NOT IN THE LIST OF CARDS CUTS ARE DEFINED
          C  C TO 44 - 1.
          C  C
          C  C LOCAL VARIABLES
          C  C -----
          C  C LOGICAL 1 MAP (40) 1 CARD IMAGE PACKED
          C  C INTEGER 10000 (3) ARRAY CONTAINING NAMES OF COEFFS.
          C  C INTEGER 100000 (3) COUNT OF "IM, UM CARD (2 REQ.)
          C  C INTEGER 1000000 (3) SET ACCORDING TO SPECIFIC COFF
    
```

TSN 0003  
TSN 0004  
TSN 0005  
TSN 0006







```

1SN 0096
1SN 0097
C
C
C CHARACTER IS FIRST IN CROP (HOW BLANK)
C
530 NCROP = NCROP + 1
KROCHA = 1
00 540 I = 1,10
NCROP(1) = ICF(0,0)
540 CONTINUE
C
00 560 I = NCROP*72
KAMTAP = 1
IF (ICF(KHAM(1)),EO,ICE(0,0)) GO TO 600
NCROP(KHAM(1)) = KHAM(1)
KROCHA = KROCHA + 1
560 CONTINUE
C
C STORE 16 BYTES IN NCROP ARRAY
C
600 IF (NCROP(1),360 TO 630
X(1) = 5,610)
610 FORMAT(100,360) = 1
NCROP = NCROP - 1
620 GO TO 210
630 00 650 I = 1,64
00 NCROP(1,NCROP) = NCROP(1)
650 CONTINUE
C
C CHECK CURRENT RATE
C
KAD = KAMTAP + 1
IF (KAMC(1,1,72)) GO TO 505
GO TO 210
C
C VALID INPUTS START IN COLUMN 11, ENDS IN COLUMN 72.
C INPUT MUST BE NUMERIC -- THREE NUMBERS PER CARD.
C
700 KOLCHA = 11
NPKARD = 0
63-CNT = 0
705 00 710 I = KOLCHA,72
KOL = 1
IF (ICF(KHAM(1)),EO,ICE(0,0),APD,
ICE(KHAM(1)),EO,ICE(0,0)) GO TO 720
710 CONTINUE
GO TO 210
C
C CHARACTER IS NUMERIC -- DECONF
C
720 NPKARD = NPKARD + 1
NCNT = NCNT + 1
CUTCNT(1) = 0
NNT = 1
NNTV = 1
TOTAL = 0
00 730 KOLCHA = 10,72
GO TO 740
IF (ICE(KHAM(1)),EO,ICE(0,0)) TOTAL = 1
IF (ICE(KHAM(1)),EO,ICE(0,0)) GO TO 730
IF (ICE(KHAM(1)),EO,ICE(0,0)) GO TO 740
IF (KHAM(1),61,360 TO 750
NPKARD(1,1) = 1
CUTS(1,1) = CUTS(1,1) + ICF(KHAM(1)) - ICF(0,0))
IF (TOTAL(1,1),NNTV = NNTV + 1
TOTAL = 1
730 CONTINUE
C
740 IF (TOTAL(1,1),CUTS(1,1),CUTS(1,1)) GO TO 750
1SN 0100
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SOURCE STATEMENT LABELS

LABEL	ISN	ADDR	LABEL	ISN	ADDR	LABEL	ISN	ADDR	LABEL	ISN	ADDR
10	25	000528	10	25	000528	10	25	000528	10	25	000528
30	45	000530	30	45	000530	30	45	000530	30	45	000530
30	45	000530	30	45	000530	30	45	000530	30	45	000530
500	96	000536	500	96	000536	500	96	000536	500	96	000536
540	102	000530	540	102	000530	540	102	000530	540	102	000530
650	119	000536	650	119	000536	650	119	000536	650	119	000536
720	133	000536	720	133	000536	720	133	000536	720	133	000536
800	164	000536	800	164	000536	800	164	000536	800	164	000536
900	191	000536	900	191	000536	900	191	000536	900	191	000536

COMPIER GENERATED LABELS

LABEL	ISN	ADDR	LABEL	ISN	ADDR	LABEL	ISN	ADDR	LABEL	ISN	ADDR
100001	26	000534	100001	26	000534	100001	26	000534	100001	26	000534
100005	26	000534	100005	26	000534	100005	26	000534	100005	26	000534
100014	40	000536	100014	40	000536	100014	40	000536	100014	40	000536
100018	50	000536	100018	50	000536	100018	50	000536	100018	50	000536
100022	59	000536	100022	59	000536	100022	59	000536	100022	59	000536
100026	71	000536	100026	71	000536	100026	71	000536	100026	71	000536
100030	71	000536	100030	71	000536	100030	71	000536	100030	71	000536
100034	71	000536	100034	71	000536	100034	71	000536	100034	71	000536
100038	71	000536	100038	71	000536	100038	71	000536	100038	71	000536
100042	71	000536	100042	71	000536	100042	71	000536	100042	71	000536
100046	71	000536	100046	71	000536	100046	71	000536	100046	71	000536
100050	71	000536	100050	71	000536	100050	71	000536	100050	71	000536
100054	71	000536	100054	71	000536	100054	71	000536	100054	71	000536
100058	71	000536	100058	71	000536	100058	71	000536	100058	71	000536
100062	71	000536	100062	71	000536	100062	71	000536	100062	71	000536
100066	71	000536	100066	71	000536	100066	71	000536	100066	71	000536
100070	71	000536	100070	71	000536	100070	71	000536	100070	71	000536
100074	71	000536	100074	71	000536	100074	71	000536	100074	71	000536

FORMAT STATEMENT LABELS

LABEL	ISN	ADDR	LABEL	ISN	ADDR	LABEL	ISN	ADDR	LABEL	ISN	ADDR
100001	26	000534	100001	26	000534	100001	26	000534	100001	26	000534
100005	26	000534	100005	26	000534	100005	26	000534	100005	26	000534
100014	40	000536	100014	40	000536	100014	40	000536	100014	40	000536
100018	50	000536	100018	50	000536	100018	50	000536	100018	50	000536
100022	59	000536	100022	59	000536	100022	59	000536	100022	59	000536
100026	71	000536	100026	71	000536	100026	71	000536	100026	71	000536
100030	71	000536	100030	71	000536	100030	71	000536	100030	71	000536
100034	71	000536	100034	71	000536	100034	71	000536	100034	71	000536
100038	71	000536	100038	71	000536	100038	71	000536	100038	71	000536
100042	71	000536	100042	71	000536	100042	71	000536	100042	71	000536
100046	71	000536	100046	71	000536	100046	71	000536	100046	71	000536
100050	71	000536	100050	71	000536	100050	71	000536	100050	71	000536
100054	71	000536	100054	71	000536	100054	71	000536	100054	71	000536
100058	71	000536	100058	71	000536	100058	71	000536	100058	71	000536
100062	71	000536	100062	71	000536	100062	71	000536	100062	71	000536
100066	71	000536	100066	71	000536	100066	71	000536	100066	71	000536
100070	71	000536	100070	71	000536	100070	71	000536	100070	71	000536
100074	71	000536	100074	71	000536	100074	71	000536	100074	71	000536

\*OPTIONS IN EFFECT\*NAME(MAIN) OPTIMIZER(1) LINECOUNT(10) SIZE (MAX) AUTODRL(NONE)

\*OPTIONS IN EFFECT\*SOURCE EHCDCIC POLIST MODECK OBJECT MAP INFOFORMAT NUGOSTHT XREF ALC NUANSF NOTERM IBM FLAG(1)

\*STATISTICS\* SOURCE STATEMENTS = 191, PROGRAM SIZE = 4262, SURPPROGRAM NAME =PHISIN

\*STATISTICS\* NO DIAGNOSTICS GENERATED

\*\*\*\*\* END OF COMPIATION \*\*\*\*\*

24RK HYTES OF COMF NOT USED

ORIGINAL PAGE 13  
OF POOR QUALITY



ORIGINAL  
OF POOR QUALITY

APPENDIX C  
JOB CONTROL SOFTWARE



ORIGINAL PAGE IS  
OF POOR QUALITY

```

FILE: PAPHIS  340C  1  LOGS  2  CONTROL  0010  0011

* CHECK FOR ACCEPTABLE PARAMETERS
*
*   AIF AINFX EQ 3 AGO10 -CONT
*   AIFX TOO MANY-TOO FEY INPUTS
*   AIFM = 1
* -CONT AIF AIFM EQ 1 APT1 1
*
* ISSUE FILE-DEF
*
*   FILEDEF F102F001 DISK GTCLINF F4FC D (LMFCL 40 BLKSIZE 60 PERM
*   FILEDEF 5 TERMINAL (P) OUT LISTING PROGRAM
*   FILEDEF F106F001 DISK AT APTMOM LMFCL 40 BLKSIZE 40
*   FILEDEF F109F001 DISK AT APTMOM LMFCL 132 BLKSIZE 132 PERM
*   FILEDEF F120F001 DISK PHS FILE D (LMFCL 40 BLKSIZE 40
*   FILEDEF F121F001 DISK PHS CC APTMOM LMFCL 40 BLKSIZE 40
*   FILEDEF F122F001 DISK F10201 FILE D (LMFCL 40 BLKSIZE 40
*   FILEDEF F123F001 DISK F10201 FILE D (LMFCL 40 BLKSIZE 40 PERM
*
* RECALL INFO FOR FILEDEF
*
*   LOAD FILE-CALL (CLEAN NOMAP START
*
*   LOAD F4FC TO FILEDEF 01 AND CLASS FILES
*
*   F4FC GTCLINF D
*   AREAD VALS APTMOM
*   AIF APTMOM EQ 1 APT1 2
*
*   LOAD MAIN PROGRAM
*
*   LOAD PAPHIS (NOMAP CLEAR START
*
*   CLOSE FILE PRINT FILES
*
*   PRINT PHS FILE 0
*   PRINT OUT LISTING
*   SPool PRINTED CLOSE
*   APT1
*
* FPM

```



FILE: DEFCLAS EXEC B LANS / PURDUE UNIVERSITY

ACONTROL OFF

DEFCLAS

HISTORY

M A TOMPKINS LEMSCO 02/04/81 ORIGINAL CODE

PURPOSE

THIS EXEC IS USED TO DEFINE CLASSIFICATION/CLUSTER FILES.

FILENAME FILETYPE FILEMODE OF CLASS FILE OR WHITTEN  
ON A RECALL FILE (UNIT 23) BY FORTRAN ROUTINE FILMRT.  
ARGUMENTS TO THE EXEC ARE AS FOLLOWS:

FOR SEGMENT ON DATA FILE:  
FILENAME FILETYPE FILEMODE  
TAPE# FILE# TAPE DENSITY

FILE DEFINITION DESCRIPTION FOR ALL FILES USED IN THESE PROGRAMS  
AND EXEC ARE AS FOLLOWS:

UNIT	DESCRIPTION
2	GLOBAL FILE
3	GLOBAL FILE
4	GLOBAL FILE
5	GLOBAL FILE
6	GLOBAL FILE
7	GLOBAL FILE
8	GLOBAL FILE
9	GLOBAL FILE
10	GLOBAL FILE
11	GLOBAL FILE
12	GLOBAL FILE
13	GLOBAL FILE
14	GLOBAL FILE
15	GLOBAL FILE
16	GLOBAL FILE
17	GLOBAL FILE
18	GLOBAL FILE
19	GLOBAL FILE
20	GLOBAL FILE
21	GLOBAL FILE
22	GLOBAL FILE
23	GLOBAL FILE
24	GLOBAL FILE
25	GLOBAL FILE
26	GLOBAL FILE
27	GLOBAL FILE
28	GLOBAL FILE
29	GLOBAL FILE
30	GLOBAL FILE

NOTE: THOSE FILES USED BY MAINWAY SYSTEM CAN BE USED IN THIS  
PROGRAM THIS IS JUST A WARNING THAT ONE SHOULD BE CAREFUL BEFORE  
DOING SO.

EXCEPTION

THE FOLLOWING ERRORS CAUSE PROGRAM TERMINATION:

1. NO TEMPORARY DISK AVAILABLE.
2. INSUFFICIENT PARAMETERS INPUT TO PROGRAM
3. ERROR IN ACCESSING LANS DATA BASE

PROCEDURE

ASSIGN A TEMP DISK, SPECIFY LIBRARIES

SPACE 3  
A TYPE DEFCLAS 61 62 63  
GLOBAL FILE IN CMCLH FORT402  
CP QUENT VIRTUAL 12  
AIF SRETCODE NE 0 GETDISK TEMP 2M CLEAR  
AIF SRETCODE NE 0 A TYPE NO TEMP DISK ACCESSSED.  
AIF SRETCODE NE 0 NEXT 1

STACK UNIT NUMBER AND FILEDEF RECALL UNIT

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ORIGINAL PAGE IS  
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PAGE 002

```

FILE: DEFCLAS EXEC 0 LAM / PU-DIR UNIVERSITY
*
*STACK 10
*FILEDEF FT23F001 DISK FLCLAS FILE DILMECL NO DENSI/E RO PERM
*
*CHECK FOR ACCEPTABLE PARAMETER COUNT AND DETERMINE INPUT
*OPTION
*
*IF @INMFX EQ 3 AGOTO -INMF
*TYPE TOO MANY-TOO FEW INPUTS
*AFIT ?
*
*-TIME
*IF @3 EQ 1600 AGOTO -TAPE
*IF @3 EQ 100 AGOTO -TAPE
*TEST = @DATA TYPE @3
*IF @TEST EQ NUM @TYPE INPUTS NOT CORRECT
*IF @TEST EQ NUM REAT 3
*
*DATA IS ON DISK
*
*FILEDEF FT10F001 DISK @1 @2 @31 LMECL 3168 HLUCK 3168 PERM RECFM U
*STACK @1
*STACK @2
*STACK @3
*LOAD FILWRT (CLEAR NUMAP START
*EXIT 4
*
*DATA IS ON TAPE
*
*-TAPE @NAME = @CONCAT @1 @2
*TAPE @UNT @1 TAP1 RO @3
*ASK = @2 - 1
*IF @SK EQ 0 ASKP 1
*TAPE FSF @SK
*FILEDEF INHMOVE TAP1LMECL 3168 HLUCK 3168 RECFM U PERM DEN @3
*FILEDEF INHMOVE DISK @NAME CLA DILMECL 3168 BLOCK 3168 RECFM U PERM
*MOVEFILE
*DETACH 141
*FILEDEF FT10F001 DISK @NAME CLA DILMECL 3168 HLUCK 3168 RECFM U PERM
*STACK @NAME
*STACK CLA
*STACK 0
*LOAD FILWRT (CLEAR NUMAP START
*EXIT
*END

```

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PAGE 001

FILE: DEFGTRU EXEC M LANS / PU-OUT UNIVERSITY

ACCONTROL OFF

OFFGTU EXEC

HISTORY

M A TOMPKINS LEMSC01 02/04/81 ORIGINAL CODE

PURPOSE

THIS EXEC EXECUTES A FOURTH PROGRAM (GIRUINE) WHICH ACCESSES THE LANS DATA BASE FOR INFO ON REQUESTED GROUND TRUTH TAPES. GIRUINE WRITES AN EXEC (GIRUINE) WHICH TRANSMITS TO THIS EXEC THE TAPES FILE # OF TAPE THAT CONTAINS THE REQUESTED SEGMENT. IN ADDITION THE FILENAME FILETYPE FILEMODE AND UNIT # ARE PASSED TO PROGRAM FILE-41 WHICH WRITES THIS INFO TO A FILE DEFINED TO UNIT 22.

ARGUMENTS TO THE EXEC ARE AS FOLLOWS:

FOR SEGMENT ON DATA FILE:  
FILENAME FILETYPE FILEMODE  
FOR SEGMENT ON TAPE:  
TAPE# FILE# TAPE DENSITY  
FOR SEGMENT AT LANS:  
SEGMENT# YEAR (YEAR IS THE LAST 2 DIGITS OF THE YEAR OF SEGMENT)

FILE DEFINITION DESCRIPTION FOR ALL FILES USED IN THESE PROGRAMS  
AND EXEC ARE AS FOLLOWS:

UNIT	DESCRIPTION
2	GROUND TRUTH
3	TERMINAL: MEAD
4	LANS GIRUINE
5	TERMINAL: WHITE LANS ERROR MSG ROUTINE
6	HAIRMAN SYSTEM
7	HAIRMAN SYSTEM
8	HAIRMAN SYSTEM
9	GROUND TRUTH FILES
10	HAIRMAN SYSTEM
11 - 14	HAIRMAN SYSTEM
21	HAIRMAN SYSTEM
22	GROUND TRUTH FILE INFO
23	HAIRMAN SYSTEM
24-24	HAIRMAN SYSTEM
30	MEAD UNIT

NOTE: THOSE FILES USED BY HAIRMAN SYSTEM CAN BE USED IN THIS PROGRAM THIS IS JUST A WARNING THAT ONE SHOULD BE CAREFUL BEFORE DOING SO.

EXCEPTION

THE FOLLOWING ERRORS CAUSE PROGRAM TERMINATION:

1. NO TEMPORARY DISK AVAILABLE.
2. INSUFFICIENT PARAMETERS INPUT TO PROGRAM
3. 300 INPUT NOT AS EXPECTED
4. ERROR IN ACCESSING LANS DATA BASE

PROCEDURE

ASSIGN A TEMP DISK. SPECIFY LIBRARIES

ASPACE 1  
STYPE DEFGTRU A1 A2 A3  
GLOBAL VIRTUAL CMSLTH FURTHM02  
CP QUERY VIRTUAL 102

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```

AIF GETCODE NF 0 GETDISK IFMP 2M LEAD
AIF GETCODE WE 0 TYPE NO TEMP DISK ACCESSED.
SIF GETCODE JE 0 GETI 1

```

- ISSUE FILEDIFS FOR FILMRT FUMTAN PROGRAM
- CHECK FOR ACCEPTABLE PARAMETER COUNT AND UT TERMINE INPUT
- OPTION

```

-NO
FILEDEF 1 TFMH(FMH
FILEDEF FT22(F01) DISK FLGTHU FILE DILWELL BU MLKSIZE BU MENA
AF 1 INDEA LT 2 AGOTO -NO
AF 1 INDEA LE 3 AGOTO -INDE
ATYPE TUN MANY-TUN FF= INPUTS
AFXT 2

```

```
-TIME JUNII = 09
AIF SINX EQ 2 AGOTO -LAMS
AIF Q3 EQ 1600 AGOTO -TAP
BIF Q3 EQ 400 AGOTO -TAP
AIFST = ADATATYPE Q3
AIF TEST EQ MIN TYPE INPUTS NOT CORRECT
AIF TEST EQ MAX TYPE INPUTS
```

DATA IS ON DISK

```
FILEDEF FTOGFRN) DISK &1 &2 &3) LMFCL 3000 BLOCK 30600 PLMM HECM U
&STACK INITI)
&STACK &1
&STACK &1
&STACK &2
&STACK &1
LOAD FILWHT (CLEAN WOMAN STANT
&APY &
```

DATA IS ON TAP.

```

-TAPE
  NAME = ACORCAT A1 A2
  TAPEOUNT A1 TAPE RU A3
  TAPE NEW TAPE
  ASK = A2 - 1
  GIP ASK FOR A SKIP 1
  TAPE FOR ASK
  FILEDEF IMMOVE TAPEILMECL 1060 HLOCK 3060 MECFM U PERM UEN A3
  FILEDEF OUTMOVE DISK NAME UTO UILMECL 3060 HLOCK 3060 MECFM U PERM
  ASKACK ADMIT
  ASKACK NAME
  ASKACK GTO
  ASKACK D
  ASKACK N
  LOAD FILEINT (CLEAR HUMAN) START
  MOVFILE
  DELACM IN
  FILEDEF FLOWFOO1 DISK NAME UTO UILMECL 3060 BLOCK 3060 MECFM U PERM
  AELL 5

```

## GET TAPE AND FILE NUMBERS FROM

54

**✓ JINSHIYAN HUAQIAN RUI XUEHU**

TEST	ADAPTIVE	TYPE	INPUTS	NOT	CORRECT	FOR	LANE	DATA	BASE
1	TEST	EQ	CHAR	TYPE					
2	TEST	EQ	CHAR	TYPE					
3	TEST	EQ	CHAR	TYPE					
4	TEST	EQ	CHAR	TYPE					
5	TEST	EQ	CHAR	TYPE					
6	TEST	EQ	CHAR	TYPE					
7	TEST	EQ	CHAR	TYPE					
8	TEST	EQ	CHAR	TYPE					
9	TEST	EQ	CHAR	TYPE					
10	TEST	EQ	CHAR	TYPE					
11	TEST	EQ	CHAR	TYPE					
12	TEST	EQ	CHAR	TYPE					
13	TEST	EQ	CHAR	TYPE					
14	TEST	EQ	CHAR	TYPE					
15	TEST	EQ	CHAR	TYPE					
16	TEST	EQ	CHAR	TYPE					
17	TEST	EQ	CHAR	TYPE					
18	TEST	EQ	CHAR	TYPE					
19	TEST	EQ	CHAR	TYPE					
20	TEST	EQ	CHAR	TYPE					
21	TEST	EQ	CHAR	TYPE					
22	TEST	EQ	CHAR	TYPE					
23	TEST	EQ	CHAR	TYPE					
24	TEST	EQ	CHAR	TYPE					
25	TEST	EQ	CHAR	TYPE					
26	TEST	EQ	CHAR	TYPE					
27	TEST	EQ	CHAR	TYPE					
28	TEST	EQ	CHAR	TYPE					
29	TEST	EQ	CHAR	TYPE					
30	TEST	EQ	CHAR	TYPE					
31	TEST	EQ	CHAR	TYPE					
32	TEST	EQ	CHAR	TYPE					
33	TEST	EQ	CHAR	TYPE					
34	TEST	EQ	CHAR	TYPE					
35	TEST	EQ	CHAR	TYPE					
36	TEST	EQ	CHAR	TYPE					
37	TEST	EQ	CHAR	TYPE					
38	TEST	EQ	CHAR	TYPE					
39	TEST	EQ	CHAR	TYPE					
40	TEST	EQ	CHAR	TYPE					
41	TEST	EQ	CHAR	TYPE					
42	TEST	EQ	CHAR	TYPE					
43	TEST	EQ	CHAR	TYPE					
44	TEST	EQ	CHAR	TYPE					
45	TEST	EQ	CHAR	TYPE					
46	TEST	EQ	CHAR	TYPE					
47	TEST	EQ	CHAR	TYPE					
48	TEST	EQ	CHAR	TYPE					
49	TEST	EQ	CHAR	TYPE					
50	TEST	EQ	CHAR	TYPE					
51	TEST	EQ	CHAR	TYPE					
52	TEST	EQ	CHAR	TYPE					
53	TEST	EQ	CHAR	TYPE					
54	TEST	EQ	CHAR	TYPE					
55	TEST	EQ	CHAR	TYPE					
56	TEST	EQ	CHAR	TYPE					
57	TEST	EQ	CHAR	TYPE					
58	TEST	EQ	CHAR	TYPE					
59	TEST	EQ	CHAR	TYPE					

2. GET LADS DISK WHICH CONTAINS JET DATA BASE

GETTISK, JSCUISK 194 F

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PAGE 003

```

FILE: DEFGTH EXEC 4 LARS / PURDUE UNIVERSITY
* FILEDEF TERMINAL AND EXEC FILE WRITTEN DURING RUN.
* FILEDEF 3 TERM(PERM
* FILEDEF 5 TERM(IPRM
* FILEDEF FT02P001 DISK GTHINFO EXEC 01 LMECL H0 HLKSIZE 40 PERM
* IF LENGTH OF 61 (SEGMENT NUMBER) < 3 CONCATENATE 0
* -LOOP 6SEGLNG = ALENGTH 61
*   AIF 6SEGLNG FO 4 6SKIP 2
*   61 = 6CUJCAI 0 61
*   AGOTO -LOOP
* STACK INPUTS TO ALLOW GTHINFO TO ACCESS LARS RTN DATA BASE.
* GTHINFO WILL WRITE GTHINFO EXEC TO ALLOW THE PASS THROUGH OF
* TAPE# FILE#.
* 6STACK 61
* 6STACK 62
* LOAD GTHINFO GTHINFO# MTEENHNA (CLEAN HUMAN START
*
* LOAD EXEC WRITTEN BY PROGRAM.
* EXEC GTHINFO 0
* HEL EDOET
* AHEAD VARS 2TAPE
* AHEAD VARS 6FILE
* 61 = 6TAPE
* 62 = 6FILE
* 61 = 600
* AIF 61 NE 0 AGOTO -TAPE
* 6EXIT
* 6END

```

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PAGE 001

FILE: END EXEC N LAY'S / MUMBAI UNIVERSITY  
• CONTROL OFF  
• END EXEC  
• -----  
• PURPOSE  
• THIS EXEC WILL CLOSE CONSOLE FILE AND PRINT THE FILE  
• -----  
• PROCEDURE  
• SPOOL CONSOLE STOP CLOSE  
• EXIT  
• SEND

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PAGE 001

FILE: STANT EXEC H LAR'S / MUNDIP UNIVERSITY  
\* CONTROL OFF  
\* STANT EXEC  
\* -----  
\* PURPOSE  
\* THIS EXEC WILL ALLOW THE USER TO SPOOL ALL RESPONSES TO THE  
\* CONSOLE. THIS IS TO BE USED WITH END EXEC WHICH WILL PRINT THE FILE.  
\* PROCEDURE  
\* -----  
\* TAG DEV CONS HOUSTON  
\* SPOOL CONS STANT NOMOLD TO MSCS  
\* &EXIT  
\* END

C-2

REQUESTED OPTIONS: NOTERM

OPTIONS IN EFFECT:

NAME(MAIN) OPTIMIZE(1) INECOUNT(80) SIZE(MAX) AUTODRUM(1) NOFORMAT NOGOSYMT XREF ALC NOANSF NOTERM IBM FLAG(1)

05/360 FORTAN M EXTENDED

DATE 81.141/10.13.52

PAGE 1

```

PROGRAM GTRUINF GET GROUND TRUTH INFO FROM LARS DATA BASE
-----
HISTORY
-----
M A TOMPKINS LEMSCO 02/04/81 ORIGINAL CODE

METHOD
-----
READ NUMBER OF ACOS SEGMENT NUMBER AND LAST TWO DIGITS OF SEG
YEAR ACCESS THE LARS RTLE DATA BASE. IF SUCCESSFUL WHITE GTRUINFO
EXEC TO TRANSMIT THE TAPE FILE TO THE DEFGTRU EXEC.

EXTERNAL REFERENCES
-----
GTRUINFO LARS ROUTINE TO ACQUIRE INFO FROM LARS RTLE DATA BASE
RTLEERR LARS ERROR MESSAGE ROUTINE

EXCEPTIONS
-----
IF IERR < 0 OR 4 WRITE ERROR MESSAGE AND WRITE EXEC
IF IERR > 0 TERMINATE PROGRAM.

LOCAL DECLARATIONS
-----
INTEGER INDEX(9,64) INFO ON GROUND TRUTH TAPES
INTEGER IYR LAST 2 DIGITS OF YEAR OF GROUND TRUTH
INTEGER IERR LARS ERROR FLAG
INTEGER ISEGNO SEGMENT NUMBER
INTEGER IDUMMY(64) ARG THAT DOESN'T PERTAIN TO THIS APPLICAT-
TION OF LARS STANDARD ROUTINE PARAMETERS

PROCEDURE
-----
READ FROM CONSOLE STACK USER INPUTS. START WRITING EXEC
WRITE(2,100)
100 FORMAT(' CONTROL OFF')
READ(3,110) ISEGNO
110 FORMAT(4)
READ(3,120) IYR
120 FORMAT(2)
CALL LARS ROUTINE FOR INFO.
CALL GTRUINFO( ISEGNO, IYR, IDUMMY, INDEX, IERR, 4, 'E')

CHECK FOR ERROR
IF (IERR.EQ.0 OR IERR.EQ.4) GO TO 160
CALL RTLEERR( IERR, 5)

```









OPTIONS IN EFFECT: NAME(MA10) OPTIMIZE(1) LINECOUNT(50) SIZE(MAA) AUTODIAGL (NONE)  
SOURCE E-CUIC NULIST NUMBER OBJECT MAP NOFJHMAI NUGOSTMT ANLF

**PROGRAM FILM CALL**

**READ FILE INFO FOR GT FILE CLASS FILE.**

MARY TUMPKINS	LEMSCU	03/12/81	ORIGINAL CODE
---------------	--------	----------	---------------

READ FROM MC CALL FILE 22 FOR GI FILE INFO AND FILE 23 FOR  
CLASSIFICATION FILE INFO. IF BOTH OR EITHER ARE EMPTY WHILE  
EXEC WITH ERROR FLAG SET TO 1, IF BOTH FILES ARE AVAILABLE  
WHILE EXEC, TO FILED GI AND CLASS FILE. THIS IS NECESSARY  
ONLY BECAUSE OF THE POSSIBILITY OF THE FILE DEFINITION BEING  
LOST ON A SYSTEM ERROR ON ONE OF THE PROGRAM EXECUTIONS.

**NUMBER**

1. IF RECALL FILE IS EMPTY ISSUE DIAGNOSTIC MSG AND WHITE ERROR EXEC.

C	ISN 0002	INTEGER NAMEST(2)	GROUND TRUTH FILE NAME
C	ISN 0003	INTEGER NAMEST(2)	GROUND TRUTH FILE TYPE
C	ISN 0004	INTEGER NAMEST	GROUND TRUTH FILE MODE
C	ISN 0005	INTEGER LOWIT	UNIT FOR GROUND TRUTH -- 9
C	ISN 0006	INTEGER NAMECL(2)	CLASS FILE NAME
C	ISN 0007	INTEGER NAMECL(2)	CLASS FILE TYPE
C	ISN 0008	INTEGER NAMECL	CLASS FILE MODE
C	ISN 0009	INTEGER JUNIT	UNIT FOR GROUND TRUTH -- 1

START WRITING RECALL EXERCISE

PUBLIC (202.0)  
 FORMATTING \CONTINUED (OFF)

READ FROM RECALL FILE FOR GROUND TRUTH DATA

```

15N 0012      UNIT1 = 0
15N 0013      READ(22,100,END=200)UNIT1,(NAME$(I),I = 1,2),
15N 0014      6 (NAME$(I),I = 1,2),MODE$(
15N 0015      100 (NAME$(I),I = 1,2),ZAS(I))

```

[illegible]

[illegible]

MODELT	MODECL
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
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21	21
22	22
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34	34
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89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

$$\begin{aligned} & \text{A} \\ & \text{B} \\ & \text{C} \\ & \text{D} \\ & \text{E} \\ & \text{F} \\ & \text{G} \\ & \text{H} \\ & \text{I} \\ & \text{J} \\ & \text{K} \\ & \text{L} \\ & \text{M} \\ & \text{N} \\ & \text{O} \\ & \text{P} \\ & \text{Q} \\ & \text{R} \\ & \text{S} \\ & \text{T} \\ & \text{U} \\ & \text{V} \\ & \text{W} \\ & \text{X} \\ & \text{Y} \\ & \text{Z} \end{aligned}$$

IS UNDER  
FICATION  
NAMECL (1  
E IS UND  
WHITE  
WHITE  
GO TO 5  
(1,2) : (NAME  
A4 : 0  
FORM HECF  
(1,2) : (NAME  
A4 : 0  
FORM HECF

TO 4000  
TUTH F  
10)  
E FOR C  
405) JUN  
112) M  
115.4  
ICATION  
2. LON  
1. LON  
1. LON  
00)  
661 (1)  
001 DIS  
BLOCK 3  
00)  
661 (1)  
001 DIS  
BLOCK 3

[illegible]

2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1986	1985	1984	1983	1982	1981	1980	1979	1978	1977	1976	1975	1974	1973	1972	1971	1970	1969	1968	1967	1966	1965	1964	1963	1962	1961	1960	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950	1949	1948	1947	1946	1945	1944	1943	1942	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929	1928	1927	1926	1925	1924	1923	1922	1921	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901	1900	1899	1898	1897	1896	1895	1894	1893	1892	1891	1890	1889	1888	1887	1886	1885	1884	1883	1882	1881	1880	1879	1878	1877	1876	1875	1874	1873	1872	1871	1870	1869	1868	1867	1866	1865	1864	1863	1862	1861	1860	1859	1858	1857	1856	1855	1854	1853	1852	1851	1850	1849	1848	1847	1846	1845	1844	1843	1842	1841	1840	1839	1838	1837	1836	1835	1834	1833	1832	1831	1830	1829	1828	1827	1826	1825	1824	1823	1822	1821	1820	1819	1818	1817	1816	1815	1814	1813	1812	1811	1810	1809	1808	1807	1806	1805	1804	1803	1802	1801	1800	1799	1798	1797	1796	1795	1794	1793	1792	1791	1790	1789	1788	1787	1786	1785	1784	1783	1782	1781	1780	1779	1778	1777	1776	1775	1774	1773	1772	1771	1770	1769	1768	1767	1766	1765	1764	1763	1762	1761	1760	1759	1758	1757	1756	1755	1754	1753	1752	1751	1750	1749	1748	1747	1746	1745	1744	1743	1742	1741	1740	1739	1738	1737	1736	1735	1734	1733	1732	1731	1730	1729	1728	1727	1726	1725	1724	1723	1722	1721	1720	1719	1718	1717	1716	1715	1714	1713	1712	1711	1710	1709	1708	1707	1706	1705	1704	1703	1702	1701	1700	1699	1698	1697	1696	1695	1694	1693	1692	1691	1690	1689	1688	1687	1686	1685	1684	1683	1682	1681	1680	1679	1678	1677	1676	1675	1674	1673	1672	1671	1670	1669	1668	1667	1666	1665	1664	1663	1662	1661	1660	1659	1658	1657	1656	1655	1654	1653	1652	1651	1650	1649	1648	1647	1646	1645	1644	1643	1642	1641	1640	1639	1638	1637	1636	1635	1634	1633	1632	1631	1630	1629	1628	1627	1626	1625	1624	1623	1622	1621	1620	1619	1618	1617	1616	1615	1614	1613	1612	1611	1610	1609	1608	1607	1606	1605	1604	1603	1602	1601	1600	1599	1598</
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APPENDIX

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**C-15**

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**SOURCE STATEMENT LABELS**

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PAGE 3

DATE 81.140/12.33.08

FORTRAN H EXTENDED

US/360

MAIN

LEVEL 2.3.0 (JUNE 78)

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FORMAT STATEMENT LABELS

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\*STATISTICS\* NO DIAGNOSTICS GENERATED

\*\*\*\*\* END OF COMPILATION \*\*\*\*\*

292K BYTES OF CODE NOT USED

APPENDIX D  
PROGRAM RUN EXAMPLES

100

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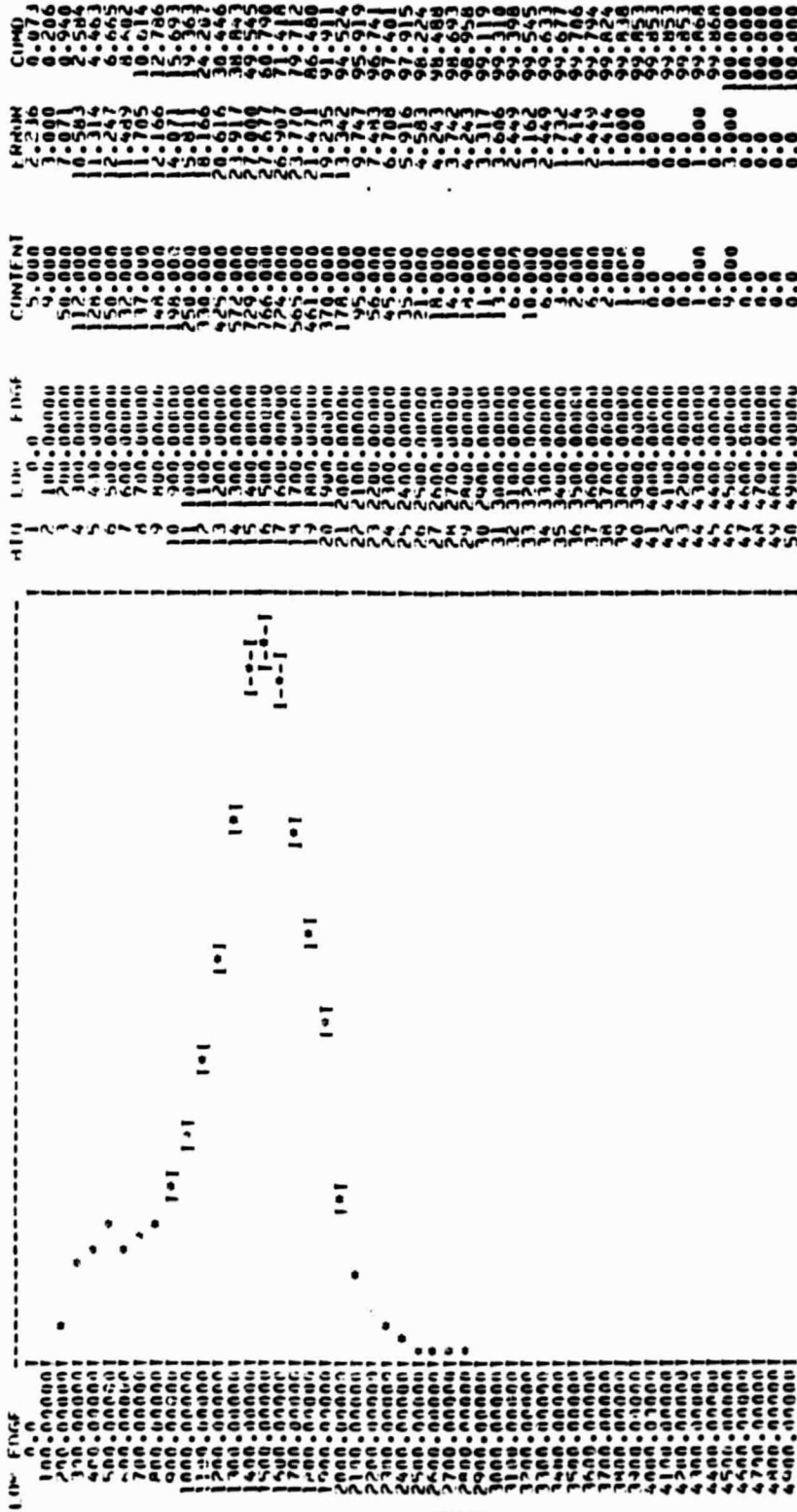
**D-1**



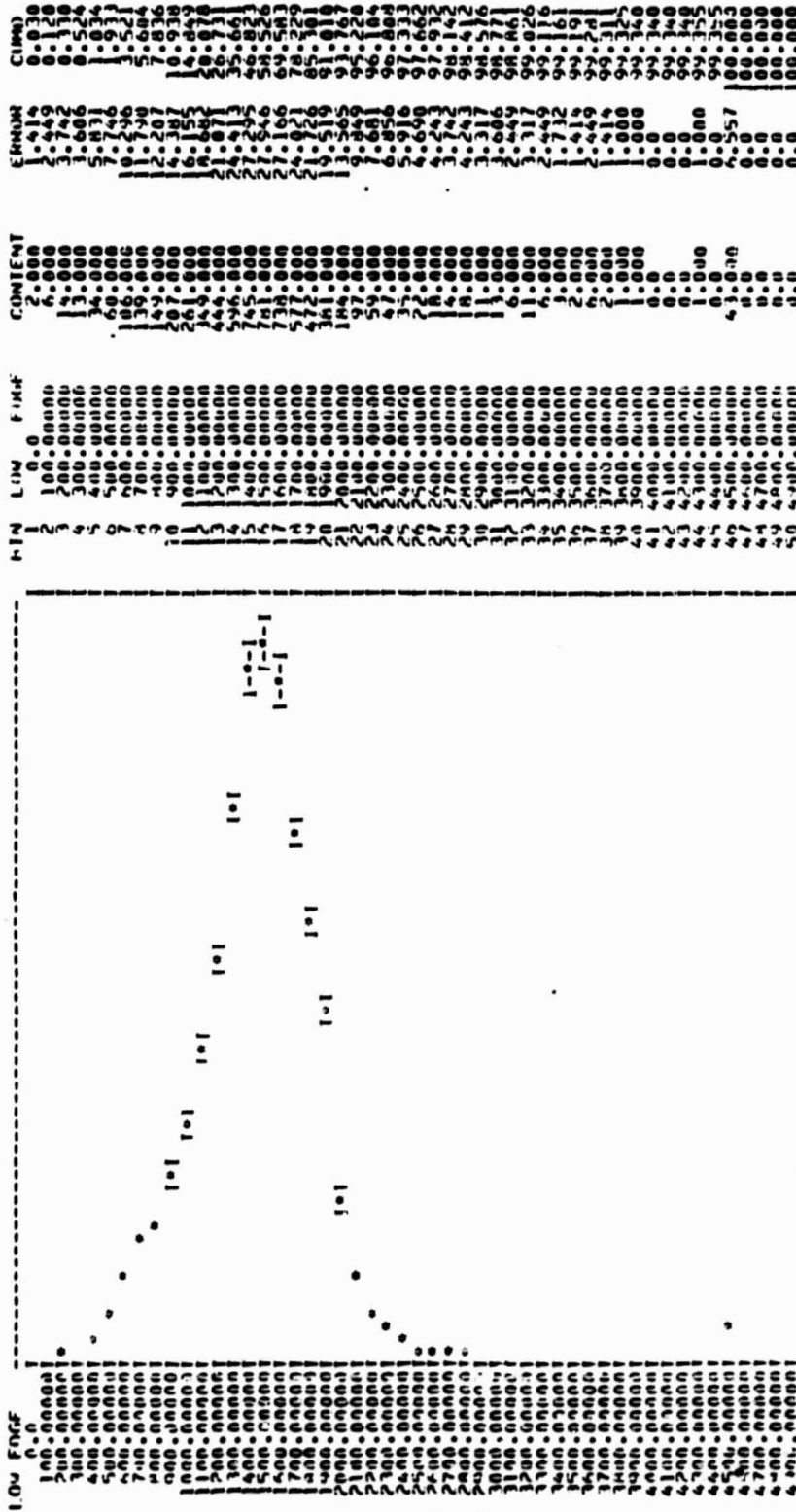


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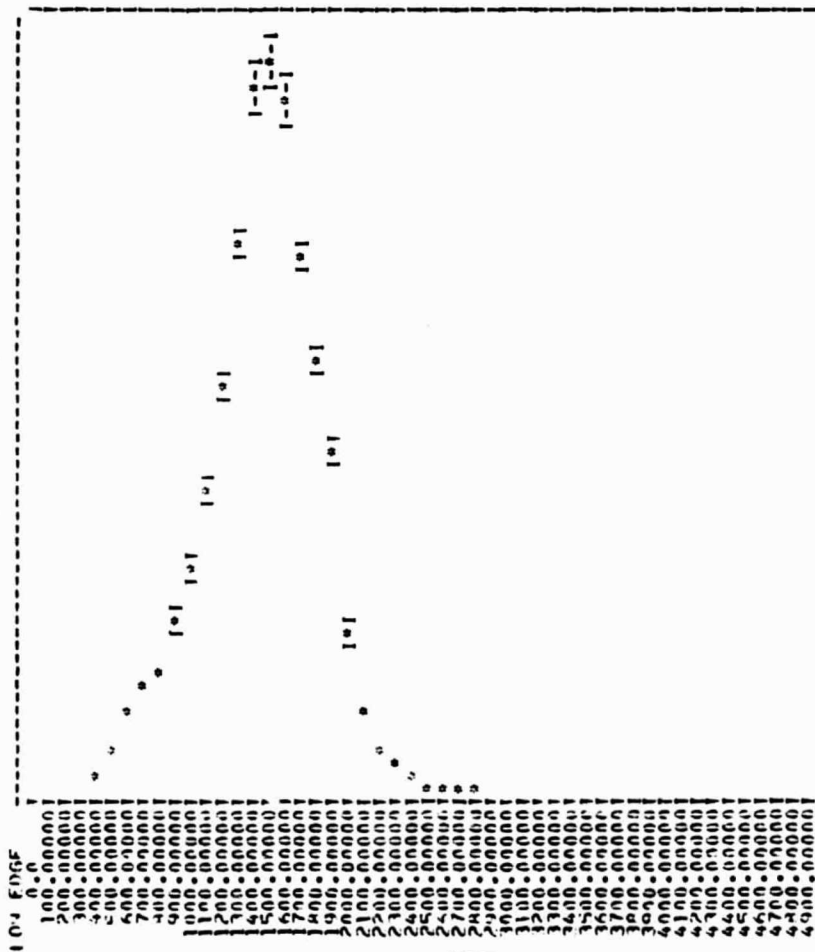
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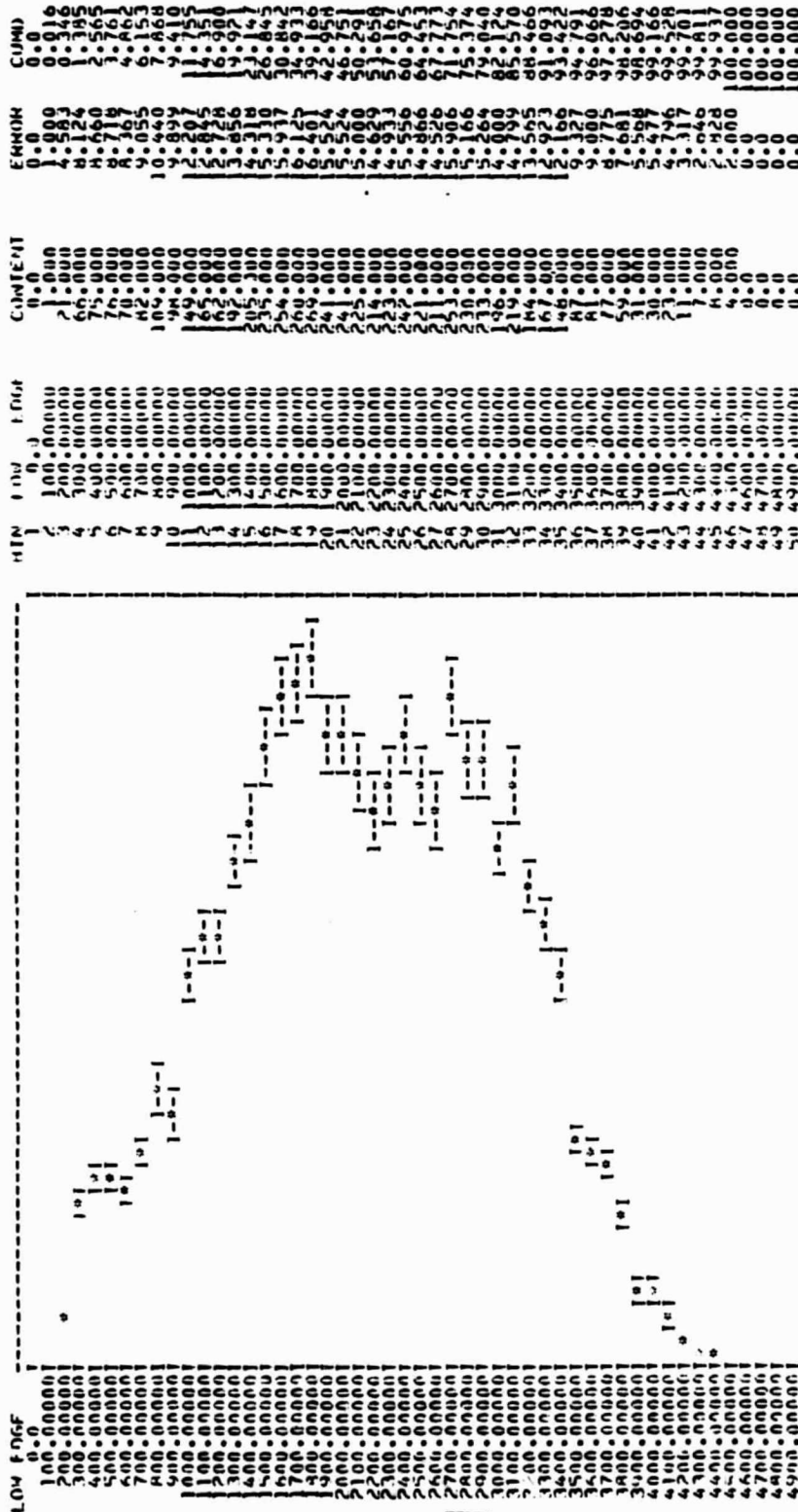
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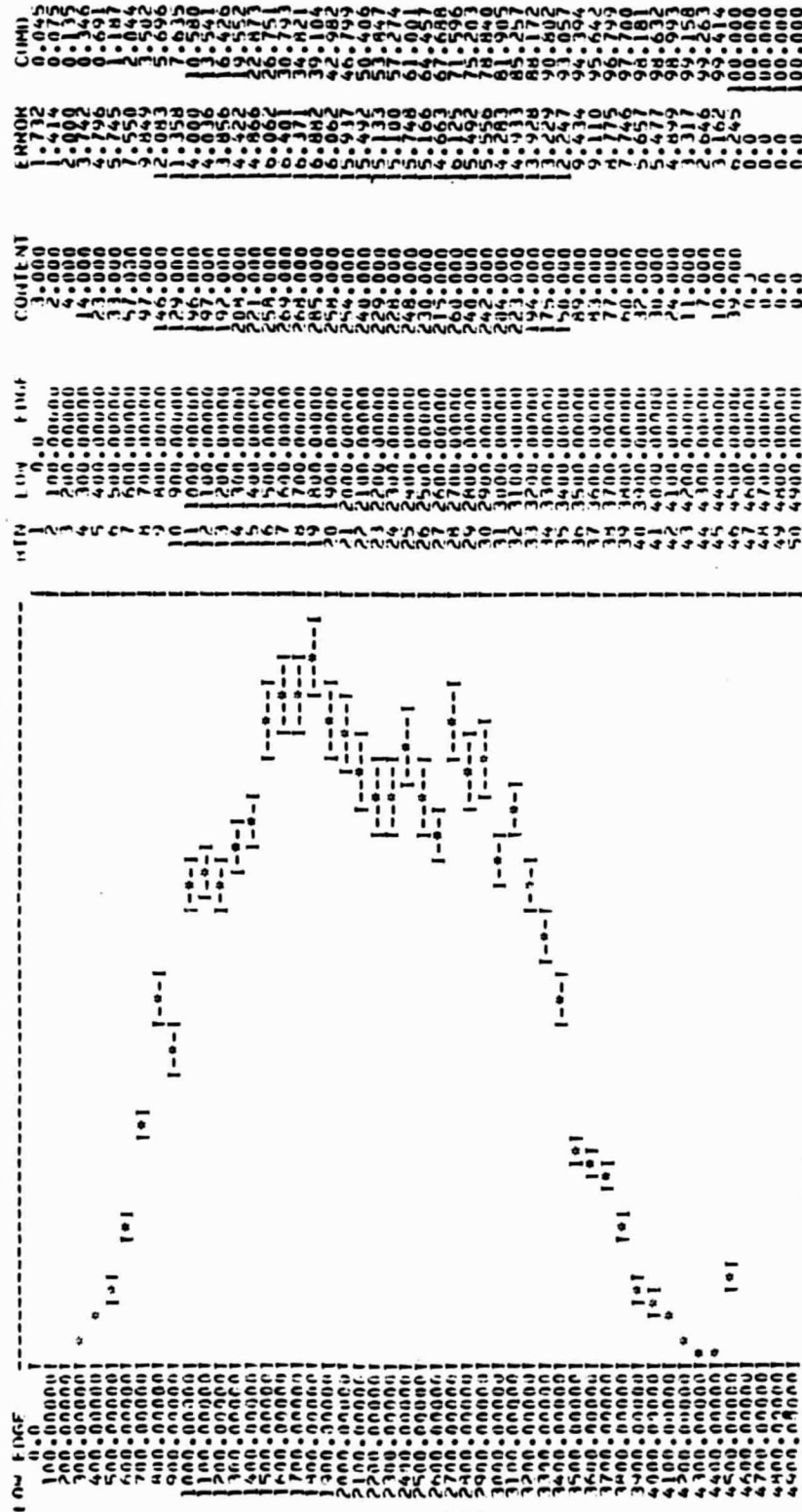
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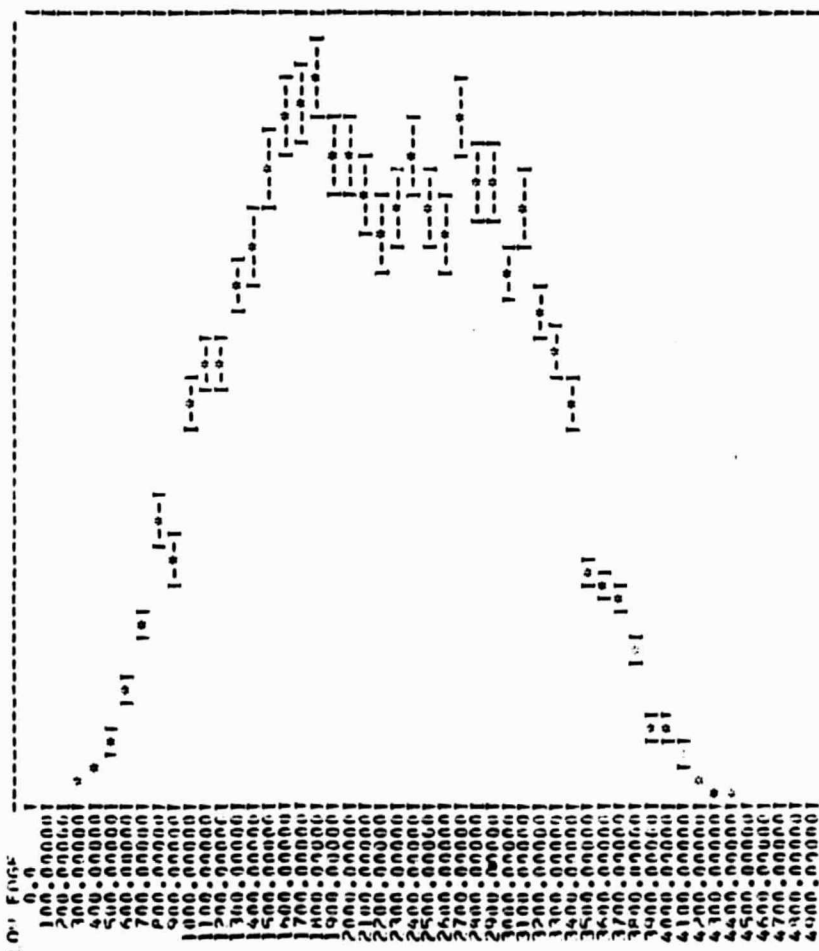
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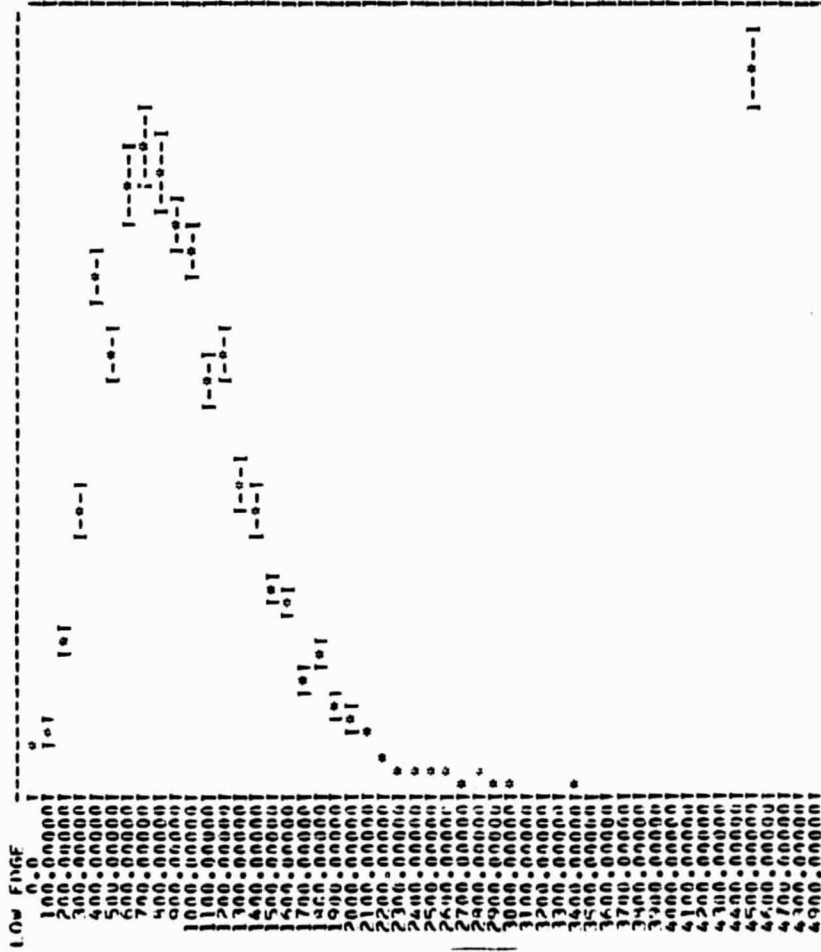


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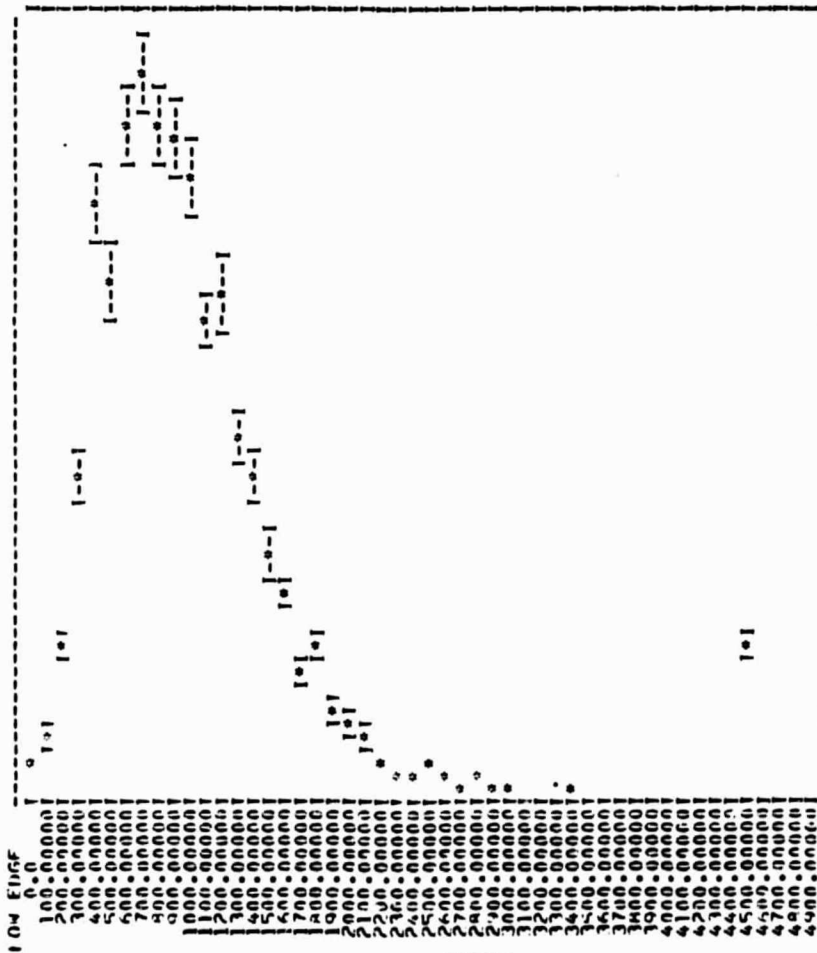
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NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65</																																			

[illegible]

ORIGINAL PAGE IS  
OF POOR QUALITY

DATE : 05/10/01 TIME : 10:47:54  
GROUND TRUTH FILE : 12370305  
CROP: OTHEPS  
MINIMUM: 0.0  
MAXIMUM: 5000.00000  
NO. HIN: 0  
INTERVAL: 100.00000  
INDEF MIN: 0  
OVER MAX: 0  
PLOT FILE: 10001000  
CLASSIFICATION FILE: 12370305  
with (0150000) <= 400.00  
10 >= 1200.00

LOW EDGE 0.0 2747 MEAN= 0.110142E+04 SLOPE= 0.735728E+04



HIN	LUM	EDGE
0	0.00000	0.00000
1	100.00000	0.00000
2	200.00000	0.00000
3	300.00000	0.00000
4	400.00000	0.00000
5	500.00000	0.00000
6	600.00000	0.00000
7	700.00000	0.00000
8	800.00000	0.00000
9	900.00000	0.00000
10	1000.00000	0.00000
11	1100.00000	0.00000
12	1200.00000	0.00000
13	1300.00000	0.00000
14	1400.00000	0.00000
15	1500.00000	0.00000
16	1600.00000	0.00000
17	1700.00000	0.00000
18	1800.00000	0.00000
19	1900.00000	0.00000
20	2000.00000	0.00000
21	2100.00000	0.00000
22	2200.00000	0.00000
23	2300.00000	0.00000
24	2400.00000	0.00000
25	2500.00000	0.00000
26	2600.00000	0.00000
27	2700.00000	0.00000
28	2800.00000	0.00000
29	2900.00000	0.00000
30	3000.00000	0.00000
31	3100.00000	0.00000
32	3200.00000	0.00000
33	3300.00000	0.00000
34	3400.00000	0.00000
35	3500.00000	0.00000
36	3600.00000	0.00000
37	3700.00000	0.00000
38	3800.00000	0.00000
39	3900.00000	0.00000
40	4000.00000	0.00000
41	4100.00000	0.00000
42	4200.00000	0.00000
43	4300.00000	0.00000
44	4400.00000	0.00000
45	4500.00000	0.00000
46	4600.00000	0.00000
47	4700.00000	0.00000
48	4800.00000	0.00000
49	4900.00000	0.00000
50	5000.00000	0.00000

CONTENT	ERR	CUMUL
17.000	123	0.00000
16.000	124	0.00000
15.000	125	0.00000
14.000	126	0.00000
13.000	127	0.00000
12.000	128	0.00000
11.000	129	0.00000
10.000	130	0.00000
9.000	131	0.00000
8.000	132	0.00000
7.000	133	0.00000
6.000	134	0.00000
5.000	135	0.00000
4.000	136	0.00000
3.000	137	0.00000
2.000	138	0.00000
1.000	139	0.00000
0.000	140	0.00000
0.000	141	0.00000
0.000	142	0.00000
0.000	143	0.00000
0.000	144	0.00000
0.000	145	0.00000
0.000	146	0.00000
0.000	147	0.00000
0.000	148	0.00000
0.000	149	0.00000
0.000	150	0.00000
0.000	151	0.00000
0.000	152	0.00000
0.000	153	0.00000
0.000	154	0.00000
0.000	155	0.00000
0.000	156	0.00000
0.000	157	0.00000
0.000	158	0.00000
0.000	159	0.00000
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0.000	163	0.00000
0.000	164	0.00000
0.000	165	0.00000
0.000	166	0.00000
0.000	167	0.00000
0.000	168	0.00000
0.000	169	0.00000
0.000	170	0.00000
0.000	171	0.00000
0.000	172	0.00000
0.000	173	0.00000
0.000	174	0.00000
0.000	175	0.00000
0.000	176	0.00000
0.000	177	0.00000
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0.000	180	0.00000
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0.000	184	0.00000
0.000	185	0.00000
0.000	186	0.00000
0.000	187	0.00000
0.000	188	0.00000
0.000	189	0.00000
0.000	190	0.00000
0.000	191	0.00000
0.000	192	0.00000
0.000	193	0.00000
0.000	194	0.00000
0.000	195	0.00000
0.000	196	0.00000
0.000	197	0.00000
0.000	198	0.00000
0.000	199	0.00000
0.000	200	0.00000

ORIGINAL PAGE IS  
OF POOR QUALITY

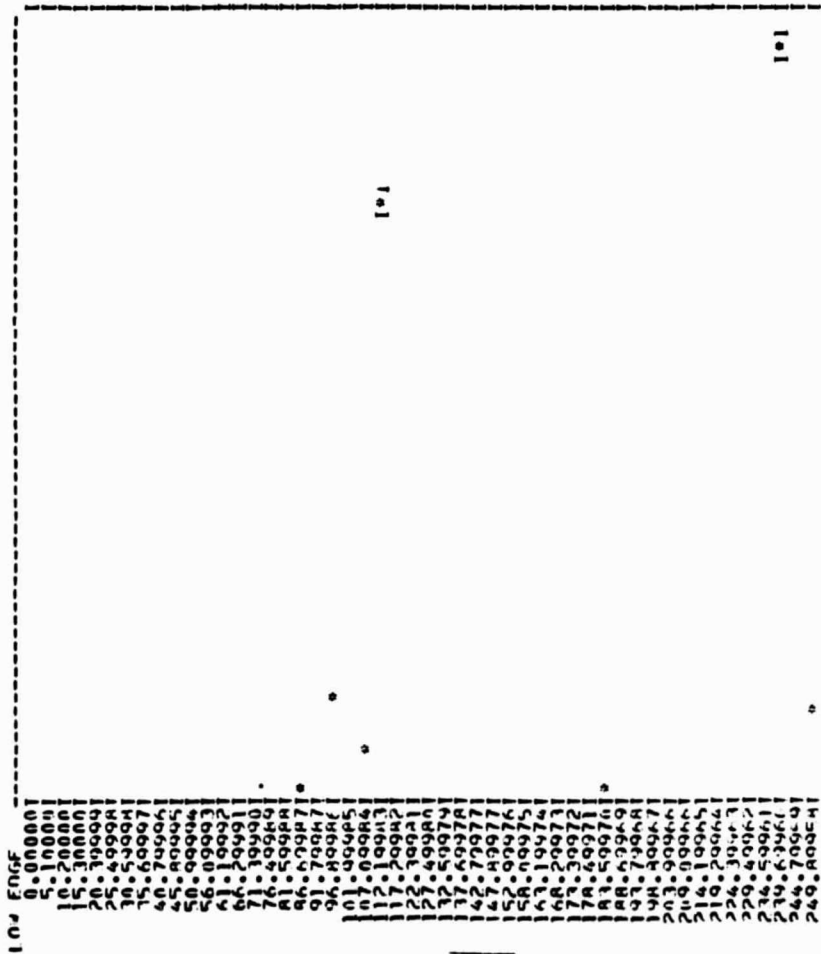
DATE : 05/19/41 TIME : 14147156

GROUND TRUTH FILE- 12379365  
CROPE OUTPUTS  
MINIMUM= 0.00000  
MAXIMUM= 254.00007  
NO. RINE= 5.10000  
INTERVAL= 0  
INFER MIN  
OVER MAX  
NPH OTTEN= 0

CLASSIFICATION FILE-  
400.00  
400.00

1231064  
1231064

1231064  
1231064



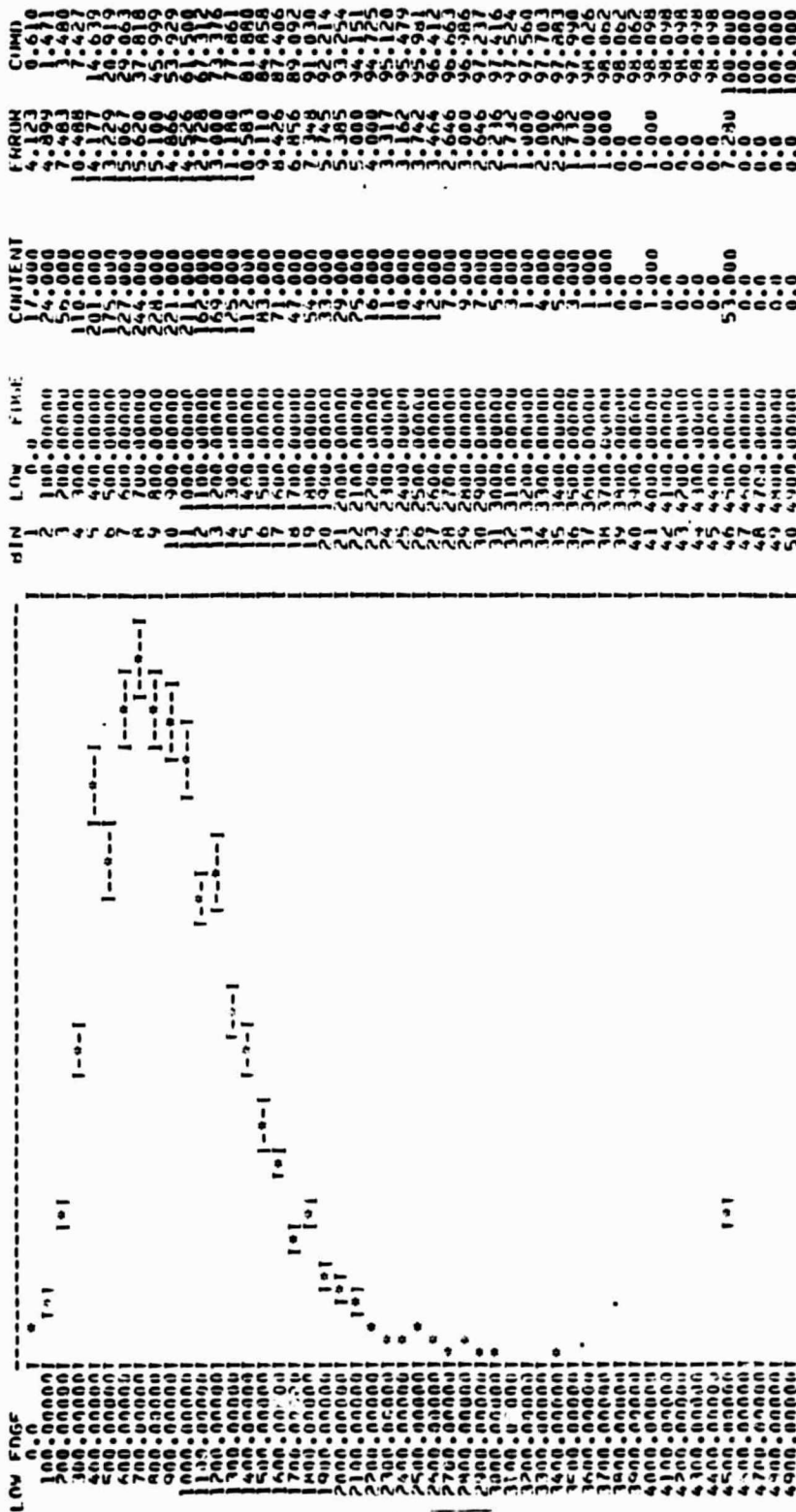
MIN	EDGE	CONTENT	ERROR	CUMD
1	0.00000	0.00000	0.00000	0.00000
2	5.10000	0.00000	0.00000	0.00000
3	10.20000	0.00000	0.00000	0.00000
4	15.30000	0.00000	0.00000	0.00000
5	20.40000	0.00000	0.00000	0.00000
6	25.50000	0.00000	0.00000	0.00000
7	30.60000	0.00000	0.00000	0.00000
8	35.70000	0.00000	0.00000	0.00000
9	40.80000	0.00000	0.00000	0.00000
10	45.90000	0.00000	0.00000	0.00000
11	51.00000	0.00000	0.00000	0.00000
12	56.10000	0.00000	0.00000	0.00000
13	61.20000	0.00000	0.00000	0.00000
14	66.30000	0.00000	0.00000	0.00000
15	71.40000	0.00000	0.00000	0.00000
16	76.50000	0.00000	0.00000	0.00000
17	81.60000	0.00000	0.00000	0.00000
18	86.70000	0.00000	0.00000	0.00000
19	91.80000	0.00000	0.00000	0.00000
20	96.90000	0.00000	0.00000	0.00000
21	102.00000	0.00000	0.00000	0.00000
22	107.10000	0.00000	0.00000	0.00000
23	112.20000	0.00000	0.00000	0.00000
24	117.30000	0.00000	0.00000	0.00000
25	122.40000	0.00000	0.00000	0.00000
26	127.50000	0.00000	0.00000	0.00000
27	132.60000	0.00000	0.00000	0.00000
28	137.70000	0.00000	0.00000	0.00000
29	142.80000	0.00000	0.00000	0.00000
30	147.90000	0.00000	0.00000	0.00000
31	153.00000	0.00000	0.00000	0.00000
32	158.10000	0.00000	0.00000	0.00000
33	163.20000	0.00000	0.00000	0.00000
34	168.30000	0.00000	0.00000	0.00000
35	173.40000	0.00000	0.00000	0.00000
36	178.50000	0.00000	0.00000	0.00000
37	183.60000	0.00000	0.00000	0.00000
38	188.70000	0.00000	0.00000	0.00000
39	193.80000	0.00000	0.00000	0.00000
40	198.90000	0.00000	0.00000	0.00000
41	204.00000	0.00000	0.00000	0.00000
42	209.10000	0.00000	0.00000	0.00000
43	214.20000	0.00000	0.00000	0.00000
44	219.30000	0.00000	0.00000	0.00000
45	224.40000	0.00000	0.00000	0.00000
46	229.50000	0.00000	0.00000	0.00000
47	234.60000	0.00000	0.00000	0.00000
48	239.70000	0.00000	0.00000	0.00000
49	244.80000	0.00000	0.00000	0.00000
50	249.90000	0.00000	0.00000	0.00000



ORIGINAL PAGE IS  
OF POOR QUALITY

DATE 1 04/19/71 11 14:23 0  
GROUP TRIM FIF- 1237985  
CROPE OTHERS  
MINIMUM= 0.0  
MAXIMUM= 5000.0000  
NO. RIM= 50  
INTERVAL= 100.0000  
UNDER MIN  
OVER MAX  
PLOTTER= 0 7747 :FAN= 0.110142F+04 S1000= 0.735720E+03

CLASSIFICATION FILE- 1237985  
TO BE 400.00 ALPHA = 0.0 THIRD CROP





ORIGINAL PAGE IS  
OF POOR QUALITY

DATE 1 05/10/71 TIME 1 11:40.1  
 GROUP WITH FILE 1234567  
 GROUP OTHERS 1000.00000  
 MINIMUM 2000.00000  
 MAXIMUM 2000.00000  
 NO. PLS 20.00000  
 INTERVAL 20.00000  
 UNIFORM MIN 0.00000  
 OVER MAX 0.00000  
 PLOTTER 2600 10000 0.144174 0.04 0.144174 0.03

